1979

FH-11/15R

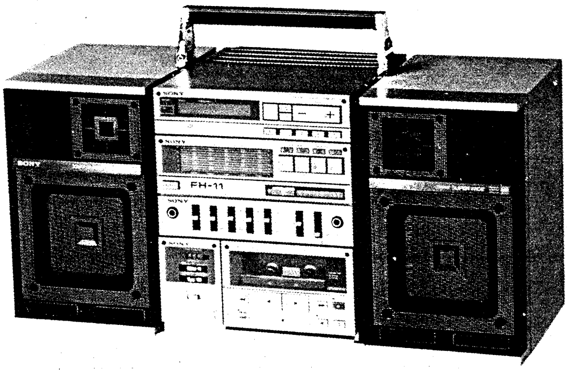
SERVICE MANUAL

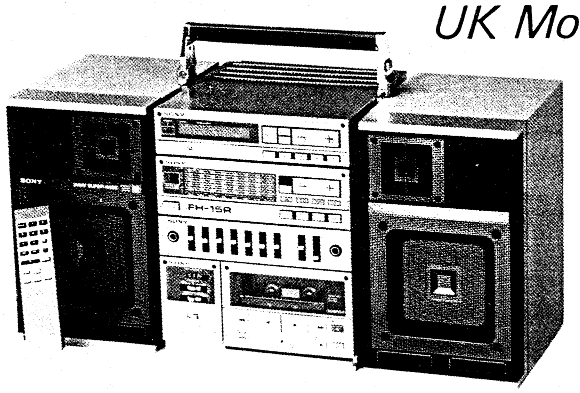
FH-11

AEP Model

FH-15R

AEP Model
UK Model





'Dolby' and the double-D symbol are the trade marks of Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

FH-15R
(Remote commander RM-158 is supplied accessory.)

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SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

COMPACT HI-DENSITY COMPONENT SYSTEM

SONY®

1979

TA-118

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TA-158

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TC-118/158R

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1. DISASSEMBLY APM-1
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RM-158

1. DISASSEMBLY RM-1
2. EXPLODED VIEW RM-1
3. PARTS LIST RM-1
4. SCHEMATIC DIAGRAM RM-2

Semiconductor Lead Layouts RM-3

5. MOUNTING DIAGRAM RM-4

* * *

COMPONENT MODEL NAME FOR FH-11/15R

	FH-11	FH-15R
Tuner	ST-118	ST-158
Amplifier	TA-118	TA-158
Cassette deck	TC-118	TC-158R
Speaker system	APM-158	APM-158
Remote commander (Supplied accessory)	———	RM-158

SPECIFICATIONS

FH-11

ST-118

System	FM stereo, FM/AM superheterodyne tuner Quartz-locked PLL digital synthesizer system

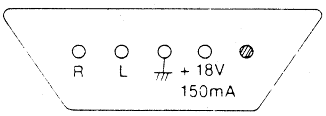
FM tuner section

Tuning range	87.5 - 108 MHz
Antenna terminals	75 ohms unbalanced
Intermediate frequency	10.7 MHz
Usable sensitivity	2.3 μV (S/N = 30 dB/75 ohms)
Signal-to-noise ratio	78 dB (mono) 70 dB (stereo)
Harmonic distortion at 1 kHz	0.2% (mono) 0.5% (stereo)
Separation at 1 kHz	40 dB
Selectivity	at 400 kHz 55 dB

MW/LW tuner section

		MW	LW
Tuning range		531 - 1,602 kHz	153 - 344 kHz
Antenna		Built-in ferrite bar antenna, External antenna terminal	
Intermediate frequency		450 kHz	
Usable sensitivity	Built-in ferrite bar antenna	250 μV/m (999 kHz)	500 μV/m (230 kHz)
	External antenna	100 μV (999 kHz)	150 μV (230 kHz)
Signal-to-noise ratio		52 dB (50 mV/m)	
Harmonic distortion		0.3% (50 mV/m, 400 Hz)	

5-pin DC input connector of ST-118



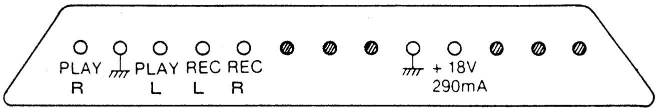
General

Dimensions	Approx. 215 x 55 x 240 mm (w/h/d) (8½ x 2⅛ x 9⅜ inches) incl. projecting parts and controls
Weight	Approx. 0.9 kg (2 lb) net

TC-118

Recording system	4-track 2-channel stereo
Frequency response	DOLBY NR OFF (DIN)
TYPE IV cassette (Sony METAL-ES)	20 – 17,000 Hz
TYPE II cassette (Sony UCX)	20 – 16,000 Hz
TYPE I cassette (Sony HF-S)	20 - 15,000 Hz
Wow and flutter	0.07% WRMS (NAB) ±0.2% (DIN)
Dimensions	Approx. 215 × 115 × 240 mm (w/h/d) (8½ × 4⅝ × 9½ inches) incl. projecting parts and controls
Weight	Approx. 2.3 kg (5 lb 2 oz) net

13 pin DC input connector of TC-118



Tape Transport Mechanism Type	TCM-150R10

TA-118

Continuous RMS power output	40 + 40 watts (6 ohms, at 1 kHz, 5% THD) 30 + 30 watts (6 ohms, 40Hz – 20 kHz, 1% THD)

Inputs	Sensitivity	Impedance
PHONO (phono jacks)	2.5 mV	50 kilohms
CD/AUX (phono jacks)	250 mV	50 kilohms
MIC (phone jack)	1 mV	low impedance

Outputs

PRE OUT (phono jacks)	Voltage 250 mV, Impedance 4.7 kilohms
HEADPHONES (stereo phone jack)	Accepts headphones of 8 ohms or more
SPEAKER	Accepts speakers of 6 to 16 ohms

Frequency response	PHONO: RIAA curve ± 0.5 dB CD/AUX: 40 Hz – 30 kHz $^{+0}_{-3}$ dB MIC: 100 Hz – 10 kHz $^{+0}_{-3}$ dB
Dimensions	Approx. 215 × 115 × 235 mm (w/h/d) (8½ × 4½ × 9⅜ inches) incl. projecting parts and controls
Weight	Approx. 4.5 kg (9 lb 15 oz) net

APM-158

Speaker system	3 way speaker system
Speaker units	Woofer: 110 cm² APM type Tweeter: 5 cm cone type Super tweeter: 3.5 cm cone type
Enclosure type	Bass reflex
Power handling capacity	Nominal 40 watts Maximum 80 watts
Frequency range	60 Hz – 20 kHz
Sensitivity	90 dB/W/m
Impedance	6 ohms
Dimensions	Approx. 170 × 280 × 220 mm (w/h/d) (6⅝ × 10⅞ × 8¾ inches)
Weight	Approx. 2.9 kg (6 lb 7 oz) net per speaker

General

Power requirements	AEP model: 220 V ac, 50/60 Hz UK model: 240 V ac, 50 Hz
Power consumption	90 watts

FH-15R

ST-158

System	FM stereo, FM/AM superheterodyne tuner Quartz-locked PLL digital synthesizer system

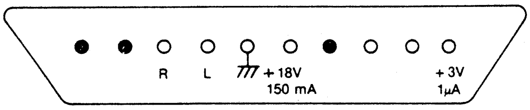
FM tuner section

Tuning range	87.5 - 108 MHz
Antenna	Telescopic antenna
Antenna terminals	75 ohms unbalanced
Intermediate frequency	10.7 MHz
Usable sensitivity	2.3 μV (S/N = 30 dB/75 ohms)
Signal-to-noise ratio	78 dB (mono) 70 dB (stereo)
Harmonic distortion at 1 kHz	0.2% (mono) 0.5% (stereo)
Separation at 1 kHz	40 dB
Selectivity	at 400 kHz, 55 dB

MW/LW tuner section

		MW	LW
Tuning range		531 - 1,602 kHz	153 - 344 kHz
Antenna		Built-in ferrite bar antenna, External antenna terminal	
Intermediate frequency		450 kHz	
Usable sensitivity	Built-in ferrite bar antenna	250 μV/m (999 kHz)	500 μV/m (230 kHz)
	External antenna	100 μV (999 kHz)	150 μV (230 kHz)
Signal-to-noise ratio		52 dB (50 mV/m)	
Harmonic distortion		0.3% (50 mV/m, 400 Hz)	

10-pin DC input connector of ST-158



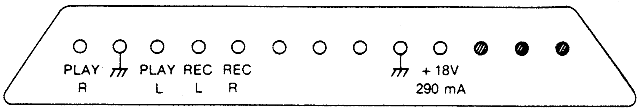
General

Dimensions	Approx.215 × 55 × 240 mm (w/h/d) ($8^{1}/_{2}$ × $2^{1}/_{8}$ × $9^{3}/_{8}$ inches) incl. projecting parts and controls
Weight	Approx. 0.9 kg (2 lb) net

TC-158R

Recording system	4-track 2-channel stereo
Frequency response	DOLBY NR OFF (DIN) With TYPE IV cassettes (Sony METAL-S) 30-16,000 Hz (±3 dB) With TYPE II cassettes (Sony UCX) 30-15,000 Hz (±3 dB) With TYPE I cassettes (Sony HF-S) 30-14,000 Hz (±3 dB)
Wow and flutter	0.07% WRMS (NAB) ± 0.2% (DIN)
Dimensions	Approx. 215 × 115 × 240 mm (w/h/d) ($8^{1}/_{2}$ × $4^{5}/_{8}$ × $9^{1}/_{2}$ inches) incl. projecting parts and controls
Weight	Approx. 2.3 kg (5 lb 12 oz) net

13-pin DC input connector of TC-158R



Tape Transport Mechanism Type	TCM-150R10

TA-158

Continuous RMS power output	40 + 40 watts (6 ohms, at 1 kHz, 5% THD) 30 + 30 watts (6 ohms, 40Hz – 20 kHz, 1% THD)

Inputs	Sensitivity	Impedance
PHONO (phono jacks)	2.5 mV	50 kilohms
CD/AUX (phono jacks)	250 mV	50 kilohms
MIC (phone jack)	1 mV	low impedance

Outputs

PRE OUT (phono jacks)	Voltage 250 mV, Impedance 4.7 kilohms
HEADPHONES (stereo phone jack)	Accepts headphones of 8 ohms or more
SPEAKER	Accepts speakers of 6 to 16 ohms

Frequency response	PHONO: RIAA curve ± 0.5 dB CD/AUX 40 Hz – 30 kHz $^{+0}_{-3}$ dB MIC: 100 Hz – 10 kHz $^{+0}_{-3}$ dB
Dimensions	Approx. 215 × 115 × 235 mm (w/h/d) ($8^{1}/_{2}$ × $4^{1}/_{2}$ × $9^{3}/_{8}$ inches) incl. projecting parts and controls
Weight	Approx. 4.5 kg (9 lb 15 oz) net

APM-158

Speaker system	3 way speaker system
Speaker units	Woofer: 110 cm^2 APM type Tweeter: 5 cm dia, cone type Super tweeter: 3.5 cm dia, cone type
Enclosure type	Bass reflex
Frequency range	60 Hz – 20 kHz
Sensitivity	90 dB/W/m
Impedance	6 ohms
Dimensions	Approx. 170 × 280 × 220 mm (w/h/d) ($6^{5}/_{8}$ × $10^{7}/_{8}$ × $8^{3}/_{4}$ inches)
Weight	Approx. 2.9 kg (6 lb 7 oz) net per speaker

General

Power requirements	AEP model: 220 V ac, 50/60 Hz UK model: 240 V ac, 50 Hz
Power consumption	90 watts
Dimensions	Approx. 570 x 345 x 230 mm (w/h/d) ($22^{3}/_{8}$ x $13^{5}/_{8}$ x $9^{1}/_{8}$ inches) incl. projecting parts and controls
Weight	Approx. 14.2 kg (31 lb 5 oz) net Approx. 16 kg (35 lb 5 oz) in shipping carton

SERVICING NOTE

MELF (Metal Electrodes Face-Bonding) Components

Warning

If MELF components are forcibly removed from the printed circuit board with pincers or pliers, the circuit board pattern is likely to peel away. Always remove MELF components according to the procedure described on the next page. Replace MELF components with the lead type components.

MELF components are soldered directly to the surface of the printed circuit board.

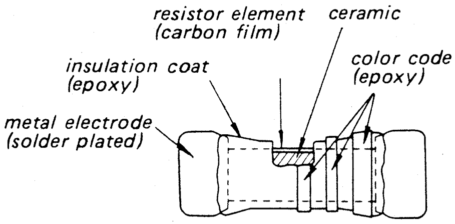
MELF resistors and capacitors have the same dimensions and are distinguished by their background colors: light brown for resistors, and pink or light green for capacitors.

The MELF resistor color coding is the same as for conventional resistors, and MELF capacitor color coding is the same as for tube-type ceramic capacitors. Note, however, that all MELF resistors are rated at ¼W and ±5%.

Components larger than resistors and without a color code are cross conductors, which are used instead of jumper wires.

1. Structure

(Resistors)


resistor element
(carbon film)
ceramic
insulation coat
(epoxy)
color code
(epoxy)
metal electrode
(solder plated)

(Capacitors)

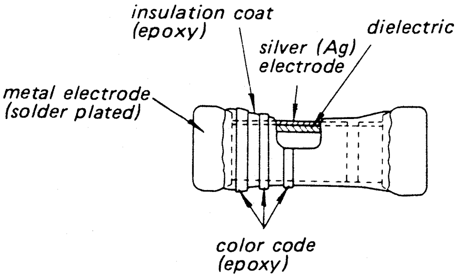
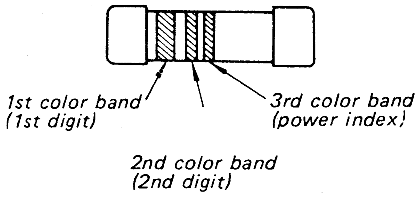
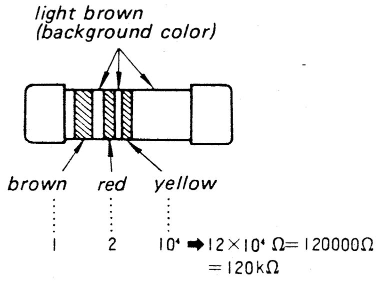

insulation coat
(epoxy)
dielectric
silver (Ag)
electrode
metal electrode
(solder plated)
color code
(epoxy)

Fig. 1

2. Color Code Reading


1st color band
(1st digit)
3rd color band
(power index)
2nd color band
(2nd digit)

(Example of Resistor)


light brown
(background color)
brown
red
yellow
1
2
10⁴ ⇒ 12×10⁴ Ω= 120000Ω
= 120kΩ

(Example of Capacitor)

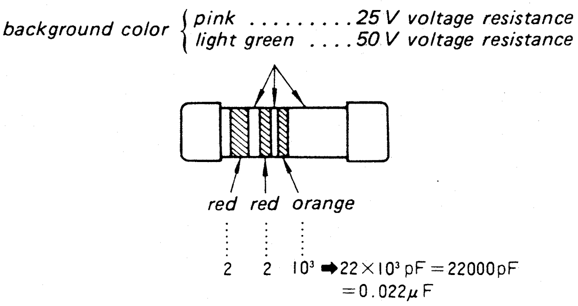

background color
pink ....25 V voltage resistance
light green ....50 V voltage resistance
red
red
orange
2
2
10³ ⇒ 22×10³ pF = 22000pF
= 0.022μF

Fig. 2

3. How to Remove MELF Components and Mount Replacements

Use a soldering iron of at least 40W with an iron tip 4mm in diameter and file the tip down to the angle shown in the diagram.

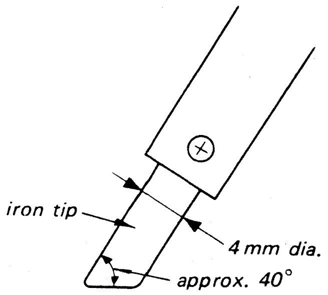

iron tip
4mm dia.
approx. 40°

Fig. 3

1. Bring the flat surface of the soldering iron in equal contact with both soldered ends of the component.
2. The solder should melt in about 4 seconds. (The solder will melt more readily if a small amount of solder is attached to the iron tip and the iron tip is placed against the component.)
3. Once the solder has melted, tap the component aside with the tip of the soldering iron, and remove it from the board.

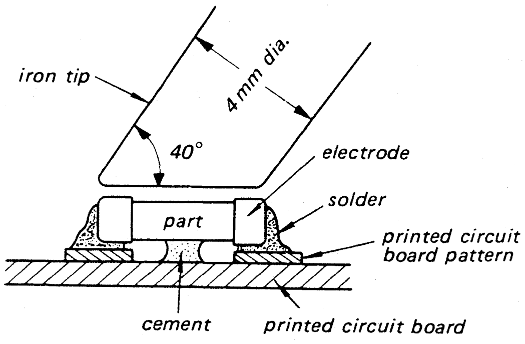

iron tip
4mm dia.
40°
electrode
solder
part
printed circuit board pattern
cement
printed circuit board

Fig. 4

4. Use lead type resistors or capacitors to replace the MELF components.
   These replacements may be mounted either with short leads (see Fig. 5), or by covering a lead with tubing (see Fig. 6).

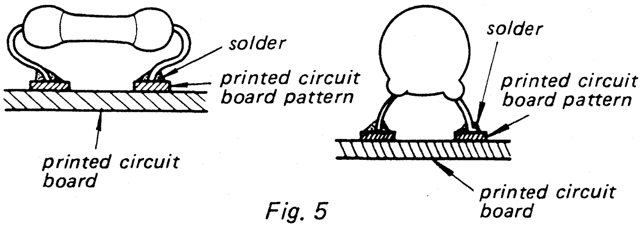

solder
printed circuit board pattern
printed circuit board
solder
printed circuit board pattern
printed circuit board

Fig. 5

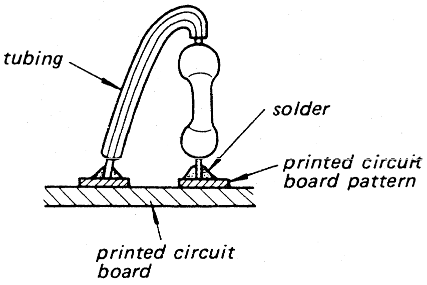

tubing
solder
printed circuit board pattern
printed circuit board

Fig. 6

MODEL IDENTIFICATION

(TC-118, TC-158R and APM-158 have no diffrences among AEP, G-AEP, UK models.)

– *Specification Label* –

TA-118

- This label is sticked on TA-118 ... For WEST GERMANY model

SONY® MODEL NO. FH-11

COMPACT HI-DENSITY COMPONENT SYSTEM

ST-118 : FM STEREO/FM-AM TUNER
TA-118 : INTEGRATED STEREO AMPLIFIER
TC-118 : STEREO CASSETTE DECK
APM-158 : SPEAKER SYSTEM

AC: 220 V ~ 50/60 Hz 90 W

□ FTZ 31/585S

SERIAL NO.
MADE IN JAPAN

- AEP model except for WEST GERMANY

SONY® MODEL NO. TA-118

INTEGRATED STEREO AMPLIFIER
COMPACT HI-DENSITY COMPONENT SYSTEM FH-11

AC: 220 V ~ 50/60 Hz 90 W

□

SERIAL NO.
MADE IN JAPAN

TA-158

- This label is sticked on TA-158 ... For WEST GERMANY model

SONY® MODEL NO. FH-15R

COMPACT HI-DENSITY COMPONENT SYSTEM

ST-158 : FM STEREO/FM-AM TUNER
TA-158 : INTEGRATED STEREO AMPLIFIER
TC-158R : STEREO CASSETTE DECK
APM-158 : SPEAKER SYSTEM

AC: 220 V ~ 50/60 Hz 90 W

□ FTZ 31/585S

SERIAL NO.
MADE IN JAPAN

- AEP model except for WEST GERMANY, UK model

SONY® MODEL NO. TA-158

INTEGRATED STEREO AMPLIFIER
COMPACT HI-DENSITY COMPONENT SYSTEM FH-15R

▨ 90 W

□

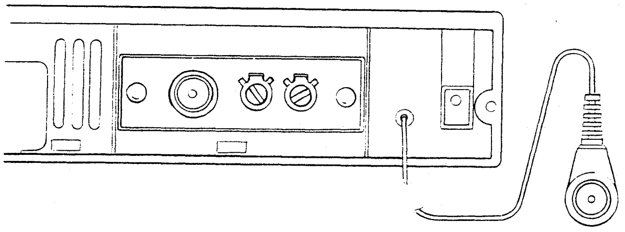
SERIAL NO.
MADE IN JAPAN

{ AEP Model: AC: 220 V ~ 50/60 Hz
UK Model: AC: 240 V ~ 50 Hz

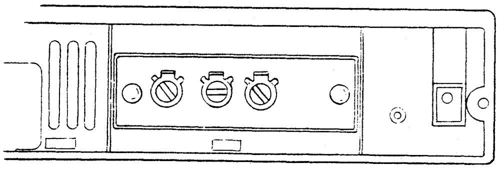
ST-118, 158

– Antenna Terminal (Rear Panel) –

- For WEST GERMANY model

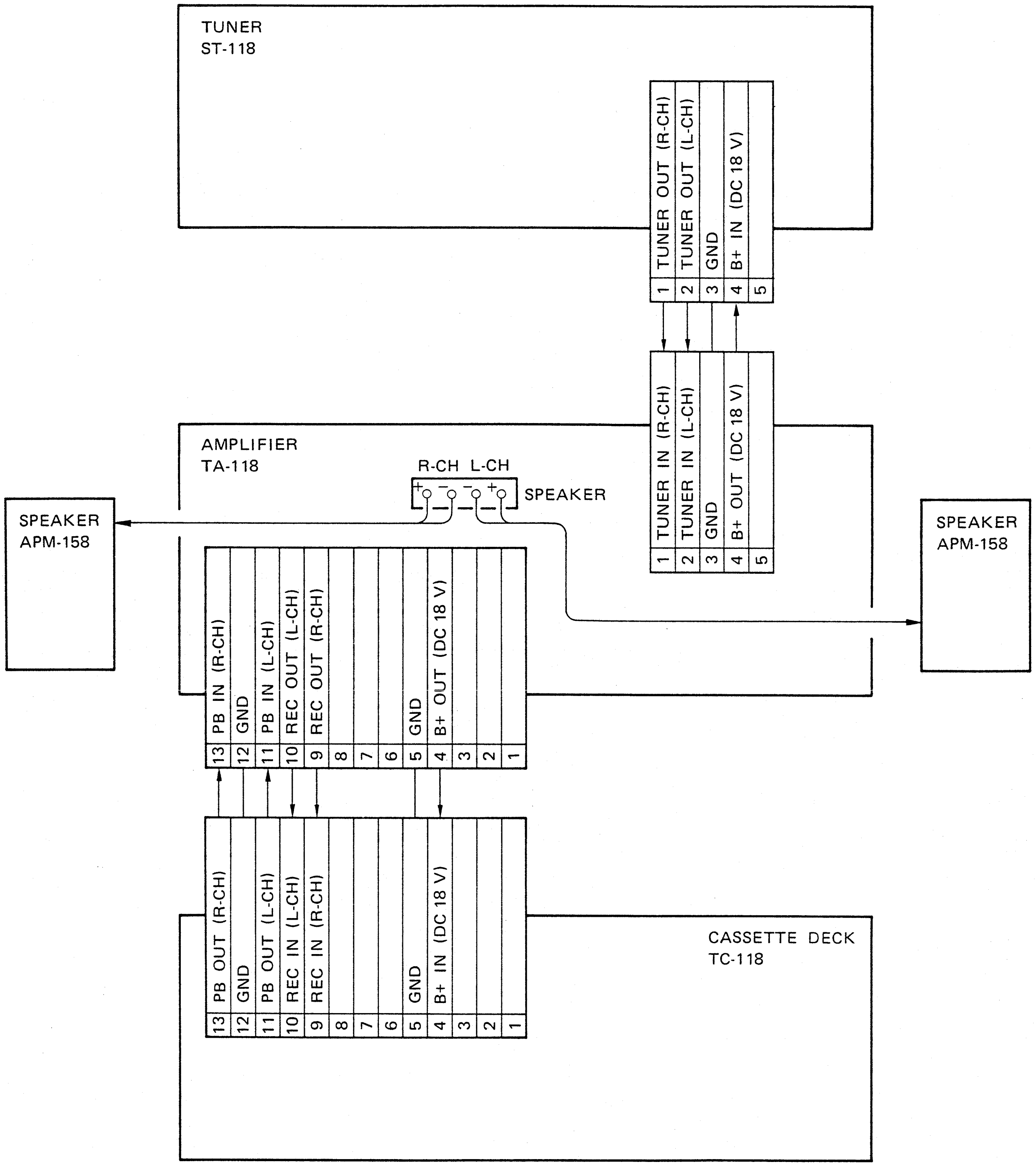


- AEP model except for WEST GERMANY, UK model

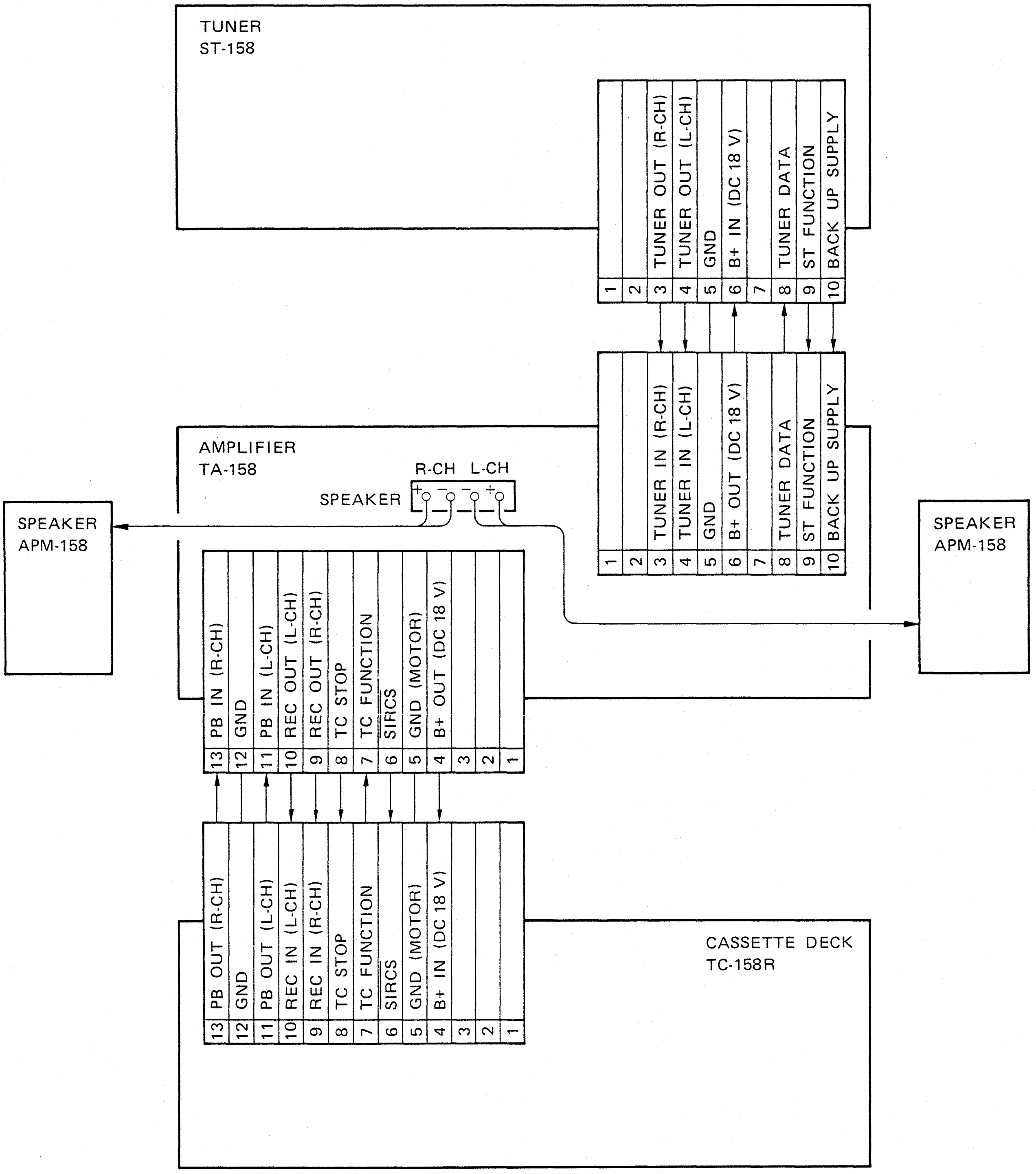


CONNECTOR'S SIGNAL ASSIGNMENT

FH-11

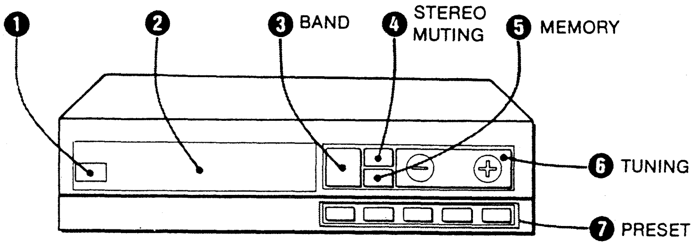

TUNER
ST-118
1 TUNER OUT (R-CH)
2 TUNER OUT (L-CH)
3 GND
4 B+ IN (DC 18 V)
5
1 TUNER IN (R-CH)
2 TUNER IN (L-CH)
3 GND
4 B+ OUT (DC 18 V)
5
AMPLIFIER
TA-118
R-CH L-CH
+ − − +
SPEAKER
SPEAKER
APM-158
SPEAKER
APM-158
13 PB IN (R-CH)
12 GND
11 PB IN (L-CH)
10 REC OUT (L-CH)
9 REC OUT (R-CH)
8
7
6
5 GND
4 B+ OUT (DC 18 V)
3
2
1
13 PB OUT (R-CH)
12 GND
11 PB OUT (L-CH)
10 REC IN (L-CH)
9 REC IN (R-CH)
8
7
6
5 GND
4 B+ IN (DC 18 V)
3
2
1
CASSETTE DECK
TC-118

FH-15R

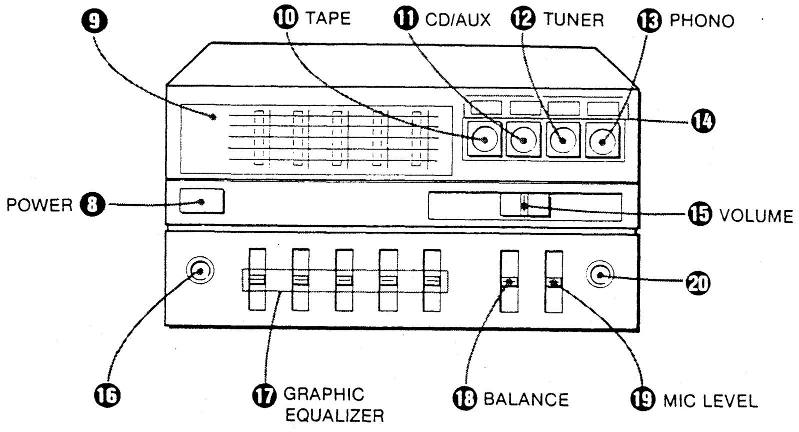

TUNER
ST-158
1
2
3 TUNER OUT (R-CH)
4 TUNER OUT (L-CH)
5 GND
6 B+ IN (DC 18 V)
7
8 TUNER DATA
9 ST FUNCTION
10 BACK UP SUPPLY
1
2
3 TUNER IN (R-CH)
4 TUNER IN (L-CH)
5 GND
6 B+ OUT (DC 18 V)
7
8 TUNER DATA
9 ST FUNCTION
10 BACK UP SUPPLY
AMPLIFIER
TA-158
R-CH L-CH
SPEAKER
+ − − +
SPEAKER
APM-158
SPEAKER
APM-158
13 PB IN (R-CH)
12 GND
11 PB IN (L-CH)
10 REC OUT (L-CH)
9 REC OUT (R-CH)
8 TC STOP
7 TC FUNCTION
6 SIRCS
5 GND (MOTOR)
4 B+ OUT (DC 18 V)
3
2
1
13 PB OUT (R-CH)
12 GND
11 PB OUT (L-CH)
10 REC IN (L-CH)
9 REC IN (R-CH)
8 TC STOP
7 TC FUNCTION
6 SIRCS
5 GND (MOTOR)
4 B+ IN (DC 18 V)
3
2
1
CASSETTE DECK
TC-158R

FUNCTION OF CONTROLS

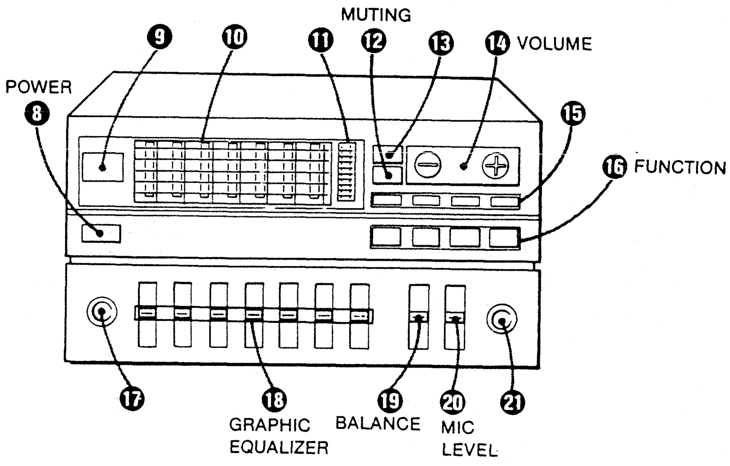
ST-118, 158


❶
❷
❸ BAND
❹ STEREO MUTING
❺ MEMORY
❻ TUNING
❼ PRESET

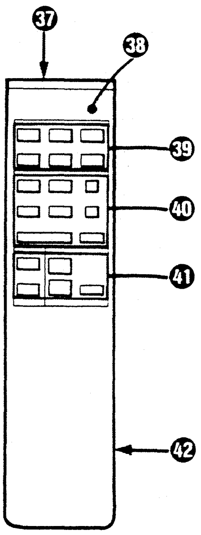
TA-118


❾
❿ TAPE
⓫ CD/AUX
⓬ TUNER
⓭ PHONO
⓮
POWER ❽
⓯ VOLUME
⓴
⓰
⓱ GRAPHIC EQUALIZER
⓲ BALANCE
⓳ MIC LEVEL

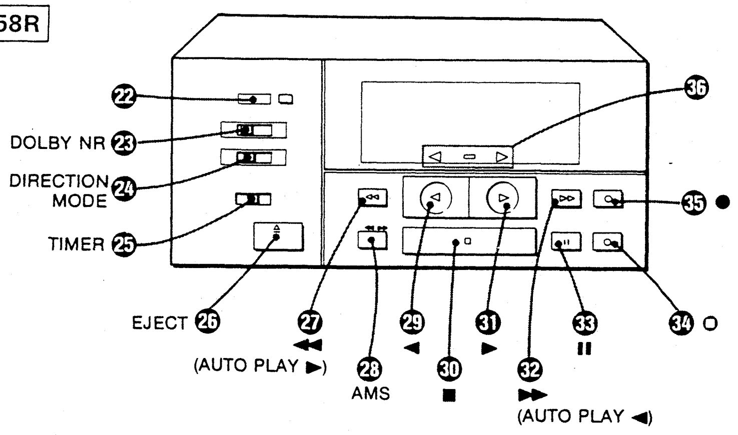
TA-158


MUTING
❾
❿
⓫
⓬
⓭
⓮ VOLUME
POWER
❽
⓯
⓰ FUNCTION
⓱
⓲ GRAPHIC EQUALIZER
⓳ BALANCE
⓴ MIC LEVEL
㉑

RM-158



TC-118, 158R


㉒
DOLBY NR ㉓
DIRECTION MODE ㉔
TIMER ㉕
EJECT ㉖
㉗ ◀◀ (AUTO PLAY ▶)
㉘ AMS
㉙ ◀
㉚ ■
㉛ ▶
㉜ ▶▶ (AUTO PLAY ◀)
㉝ ❚❚
㉞ ○
㉟ ●
㊱

Tuner ST-118, 158

❶ STEREO indicator
Lights when an FM stereo program of sufficient signal strength is tuned in.

❷ Band/frequency display
Displays the frequency received and the following items. When the PRESET key is pressed, the key number appears. When a signal is tuned in, the TUNED indication appears. When the MEMORY key is pressed, the MEMORY indication appears.

❸ BAND select key
Press to select the desired band. The band indication appears in the display. With each press, the band changes as follows: FM → MW → LW

❹ STEREO MUTING button
This button serves the dual purpose of a mode and FM muting button. Normally keep this button engaged (the MUTING indication appears) to eliminate FM interstation noise while tuning from station to station.
The tuner operates in stereo mode for stereo sound sources and will be automatically switched to mono mode for monaural sound sources.

❺ MEMORY key
To memorize a tuned station to a PRESET key, press this key and press the PRESET key.

❻ TUNING keys
Press the "+" key to tune in a higher frequency, and the "–" key to tune in a lower frequency. To change the frequency continuously, keep the key pressed.

❼ PRESET keys
To call up a memorized station, select the band and press the appropriate key.

Amplifier TA-118

❽ POWER switch
Depress this switch (⊥ ON) to turn on the power of the stereo system. To turn it off, press the switch again (⊓ OFF).

❾ SPECTRUM ANALYZER display
This is a 5-division real time analizer, and the frequency band is the same as that of the graphic equalizer.

❿ TAPE button
Press this button to listen to a taped program.

⓫ CD (compact disc)/AUX (auxiliary) button
Press to listen to or record compact disc or auxiliary programs connected to the CD/AUX inputs.

⓬ TUNER button
Press this button to listen to or record broadcast programs.

⓭ PHONO button
Press to listen to or record programs connected to the PHONO inputs.

⓮ Function indicators
The indicator lights to show the audio input source in use.

⓯ VOLUME control
Regulate the overall sound level.

⓰ HEADPHONES jack (stereo phone jack)

⓱ GRAPHIC EQUALIZER controls
To equalize the listening or recording sound, slide each control upwards to increase the level of the frequency band, and downwards to decrease the level.
100 Hz: Use to boost or cut the bass.
400 Hz: Use to adjust the middle frequency range.
1 kHz: Use to provide more presence of vocals.
4 kHz: Use to adjust the brightness of sound.
12kHz: This control effects general treble. Slide downwards to reduce high frequency noise, such as tape hiss.
To record or listen to the sound with the original tone quality, set all the controls at their center positions.

⓲ BALANCE control
Adjusts the balance of the left and right channel output levels.

⓳ MIC LEVEL (microphone level) control
Controls the input level of the microphone.
Slide the control towards MAX to increase microphone level and towards MIN to decrease it.
When not used for microphone mixing, set this control to the MIN position.

⓴ MIC (microphone) jack (phone jack)
Connect a microphone for microphone mixing.

Amplifier TA-158

❽ POWER switch
Depress this switch (⊥ ON) to turn on the power of the stereo system. To turn it off, press the switch again (⊓ OFF).

❾ R REMOTE SENSOR
Receives the infrared ray command transmitted from the supplied remote commander RM-158.

❿ SPECTRUM ANALIZER display
This is a 7-division real time analizer, and the frequency band is the same as that of the graphic equalizer.

⑪ VOL LEVEL (volume level) indicator
Indicates the output level of the amplifier.

⑫ MUTING key
Press to reduce the sound level by 20 dB. Press again to restore the same listening level as before.
This function is useful when you lower the tonearm onto a record or when you answer the telephone.

⑬ Muting indicator
Lights when the MUTING key is pressed.

⑭ VOLUME keys
Regulate the overall sound level.

⑮ Function indicators
The indicator lights to show the audio input source in use. When the power is turned on, the TUNER indicator lights.

⑯ FUNCTION select keys
Select the desired key for program source.

TAPE: For listening to a taped program.
CD/AUX: For listening to or record a compact disc or auxiliary program source connected to CD/AUX inputs.
TUNER: For listening to or record a radio program.
PHONO: For listening to or record a record program source connected to PHONO Inputs.

In order to select a tuner program, press any button of the tuner except MEMORY and STEREO MUTING buttons.
In order to select a taped program, set the cassette deck in playback mode.

⑰ HEADPHONES jack (stereo phone jack)

⑱ Graphic equalizer controls
To equalize the listening or recording sound, slide each control upwards to increase the level of the frequency band, and downwards to decrease the level.

63 Hz:	Use to boost or cut heavy bass.
150 Hz:	Use to boost or cut normal bass.
400 Hz:	Use to adjust the power, spaciousness and warmth of the sound.
1 kHz:	Use to provide more presence for vocals.
3 kHz:	Use to boost a brighter sound and to reduce stridency.
6 kHz:	Use to adjust the brightness of sound.
14 kHz:	Use to adjust the treble.

To record or listen to the sound with the original tone quality, set all the controls at their center positions.

⑲ BALANCE control
Adjusts the balance of the left and right channel output levels.

⑳ MIC LEVEL (microphone level) control
Controls the input level of the microphone.
Slide the control towards MAX to increase microphone level and towards MIN to decrease it.
When not in use of microphone mixing, set this control to the MIN position.

㉑ MIC (microphone) jack (phone jack)
Connect a microphone for microphone mixing.

Cassette deck TC-118, 158R

㉒ TAPE COUNTER and reset button
The tape counter provides a numerical reference point. To reset to zero, press the RESET button.

㉓ DOLBY NR switch
Select the Dolby NR* (Noise Reduction) system to be used for recording or playback.

OFF: To record or play back without the Dolby NR process.
B: To record or play back with the Dolby B-type NR process.
C: To record or play back with the Dolby C-type NR process.

*Dolby and the double-D symbol are trade marks of the Dolby Laboratories Licensing Corporation. Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation.

㉔ DIRECTION MODE selector
Select the mode of tape transport for recording and playback.

⇄: To record or play back one side of a cassette.
↻: To record on both sides of a cassette or to repeat playback of both sides endlessly.

㉕ TIMER standby switch
Normally set to OFF. To start recording or playback automatically using an optional timer, set to REC or PLAY.

㉖ ⏏ (eject) button
Press to open the cassette holder.

㉗ ◀◀ (rewind)/AUTO PLAY ▶ key

㉘ AMS key and indicator
Press to activate the AMS (Automatic Music Sensor). To deactivate it, press the key again. The AMS indicator lights when the AMS key is pressed.

㉙ ◀ (reverse play) key

㉚ ■ (stop) key

㉛ ▶ (play) key

㉜ ▶▶ (fast forward)/AUTO PLAY ◀ key

㉝ ❙❙ PAUSE key and indicator
Press to stop the tape momentarily during recording or playback. To disengage pause mode, press it again.
The indicator lights during pause and blinks just after the power is turned on and during record muting.

㉞ ○ REC MUTE (record muting) key

㉟ ● REC (record) key and indicator
To start recording, keeping this key pressed, press the ◀ or ▶ key. The indicator illuminates while recording.

㊱ Mode indicators
▶ : Lights up in forward mode.
◀ : Lights up in reverse mode.
■ : Lights up during recording or playback.

Remote Commander RM-158

㊲ Transmitter
Point this part towards the ▣ REMOTE SENSOR on the amplifier.

㊳ Transmitting/battery indicator
Blinks when any key on the commander is pressed. When the batteries become weak, the indicator lights faintly. When the batteries are exhausted completely, the indicator goes out.

㊴ TUNER operation keys
Number keys : Press to call up the station memorized to the PRESET key with the same number.
BAND : Press to select the band.

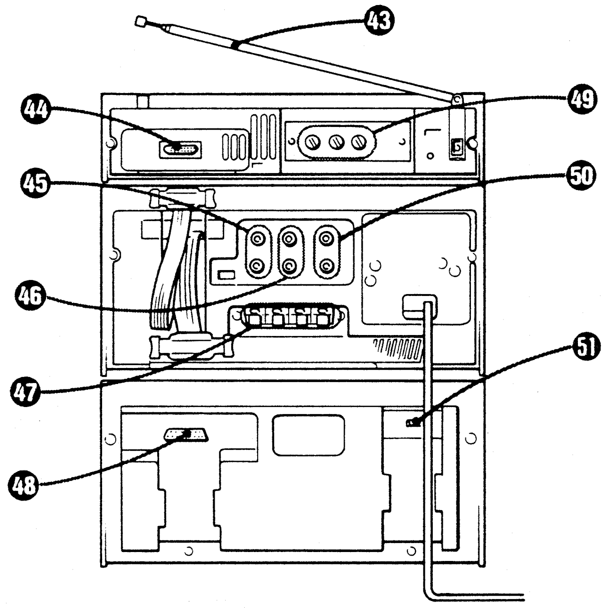
㊵ TAPE (cassette deck operation) keys
These keys have the same functions as the tape operation keys with the same marks on the cassette deck, with the exception of :

- The ○ key also functions as the AMS key when it is pressed in stop mode or playback mode.
- Auto play is not possible even if the ▶ (or ◀) key is pressed while the ◀◀ (or ▶▶) key is pressed.

㊶ Amplifier operation keys
PHONO : Press to select PHONO inputs.
CD : Press to select CD inputs.
VOL +/− : Press the "+" key to increase the volume, and the "−" key to decrease the volume.
MUTING : Press to reduce the sound level by 20 dB. Press again to restore the previous sound level.

㊷ Battery compartment (rear)

Rear panel



㊸ Telescopic antenna
Used for FM reception.

㊹ Power connector of tuner

㊺ PHONO inputs (phono jacks)
Accepts the outputs of a turntable system.

㊻ CD/AUX (compact disc/auxiliary) inputs (phono jacks)
Accepts the outputs of a compact disc player or input sources such as a playback only tape deck.

㊼ Speaker terminals

㊽ Power connector of tape deck

㊾ FM/LW/MW external antenna terminals

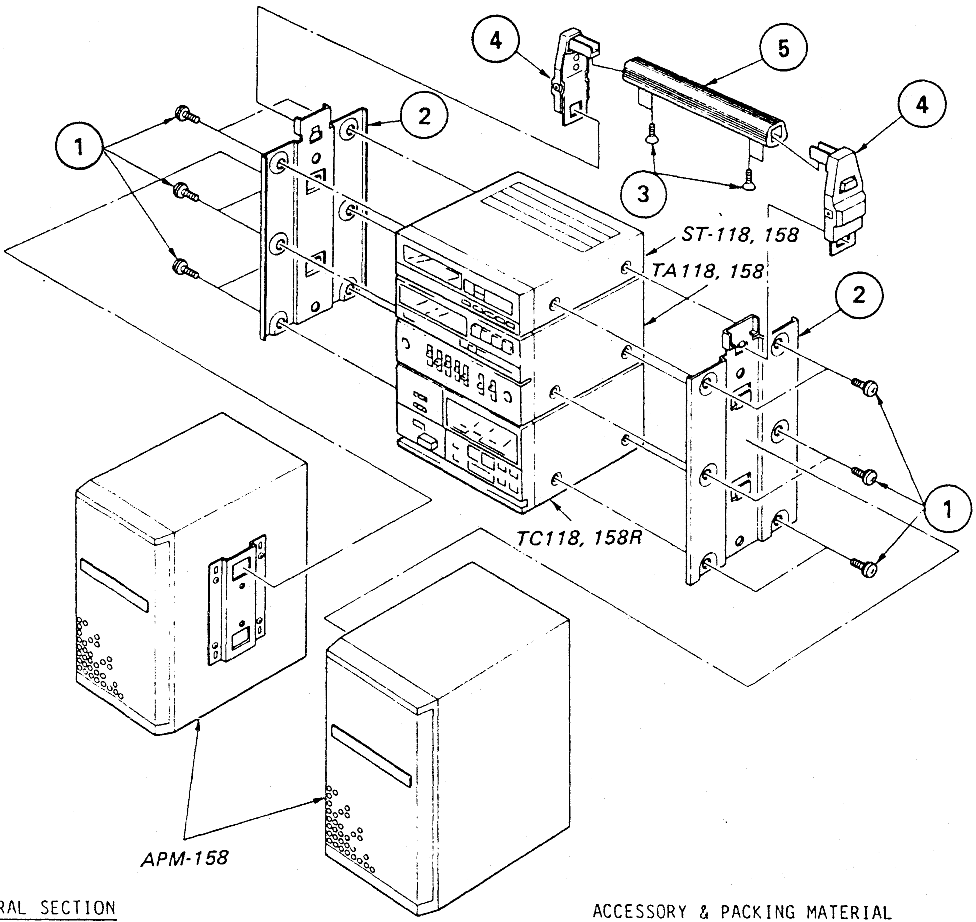
㊿ PRE OUT outputs (phone jacks)
Accepts the line inputs of a tape deck for tape recording.
Recording the sound adjusted with the GRAPHIC EQUALIZER controles or the microphone sound mixed with sources can be made.

(51) ISS (interference suppress switch)
If inteference is encountered while recording MW or LW program, slide the switch to position 1, 2 or 3 depending on which best reduces the noise.

EXPLODED VIEW AND PARTS LIST

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.



GENERAL SECTION

No.	Part No.	Description
1	X-4902-909-1	SCREW ASSY, SIDE PLATE
2	4-910-051-01	(SILVER)...PLATE (C), SIDE
2	4-910-051-11	(BLACK)....PLATE (C), SIDE
3	7-685-247-29	SCERW +KTP 3X10 TYPE 2 SLIT
4	X-4910-018-1	BRACKET ASSY, HANDLE
5	2-249-402-21	HANDLE

ACCESSORY & PACKING MATERIAL

Part No.	Description
1-463-616-11	(FH-15R)...REMOTE COMMANDER RM-158
1-555-839-00	CORD, SPEAKER
3-701-613-00	BAG, POLYETHYLENE (for SCREW ASSY)
3-701-630-00	BAG, POLYETHYLENE
3-703-895-01	(BLACK)....LABEL, COLOR
3-703-906-01	(SILVER)...LABEL, COLOR

ACCESSORY & PACKING MATERIAL

Part No.	Description
3-760-360-11	(FH-11:AEP).......MANUAL, INSTRUCTION
3-760-360-41	(FH-11:AEP).......MANUAL, INSTRUCTION
3-760-360-51	(FH-11:G-AEP).....MANUAL, INSTRUCTION
3-760-462-11	(FH-15R:AEP,UK)...MANUAL, INSTRUCTION
3-760-462-41	(FH-15R:AEP)......MANUAL, INSTRUCTION
3-760-462-51	(FH-15R:G-AEP)....MANUAL, INSTRUCTION
3-795-571-11	INSTRUCTION
*4-603-394-00	(FH-15R)...CUSHION (A)(for RM-158)
4-884-945-00	PARTITION
4-907-610-01	(FH-15R)...JOINT
4-910-050-01	(FH-11)....INDIVIDUAL CARTON
4-910-050-21	(FH-15R)...INDIVIDUAL CARTON
4-910-052-01	CUSHION (FRONT), UPPER
4-910-053-01	CUSHION (REAR), UPPER
4-910-054-01	CUSHION (FRONT), LOWER
4-910-055-01	CUSHION (REAR), LOWER
9-911-842-XX	CUSHION (F)
4-872-911-00	(TA-118,158/TC-118,158R) ...SHEET, PROTECTION
4-884-884-00	(ST-118,158)...SHEET, PROTECTION
4-910-323-01	(APM-158)......SHEET, PROTECTION
4-910-324-01	(APM-158)......CUSHION, LOWER
4-910-353-01	(APM-158)......CUSHION, UPPER

INTEGRATED STEREO AMPLIFIER

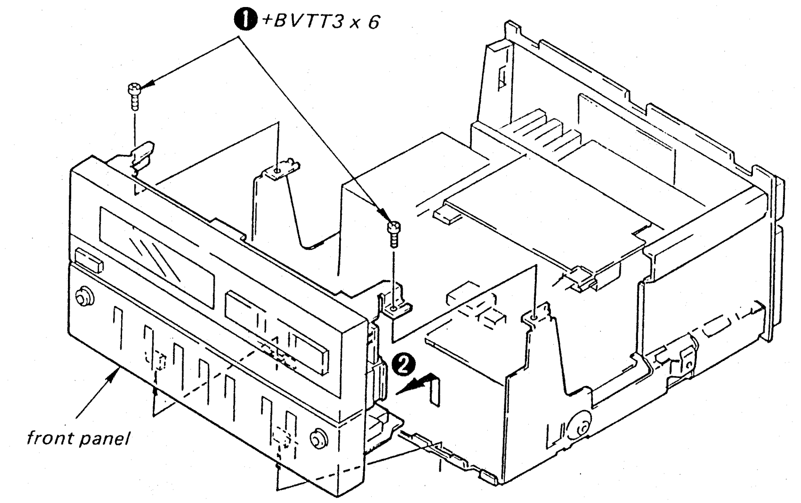
NOTE: TA-118 is an integrated stereo amplifier unit in FH-11.

1. DISASSEMBLY

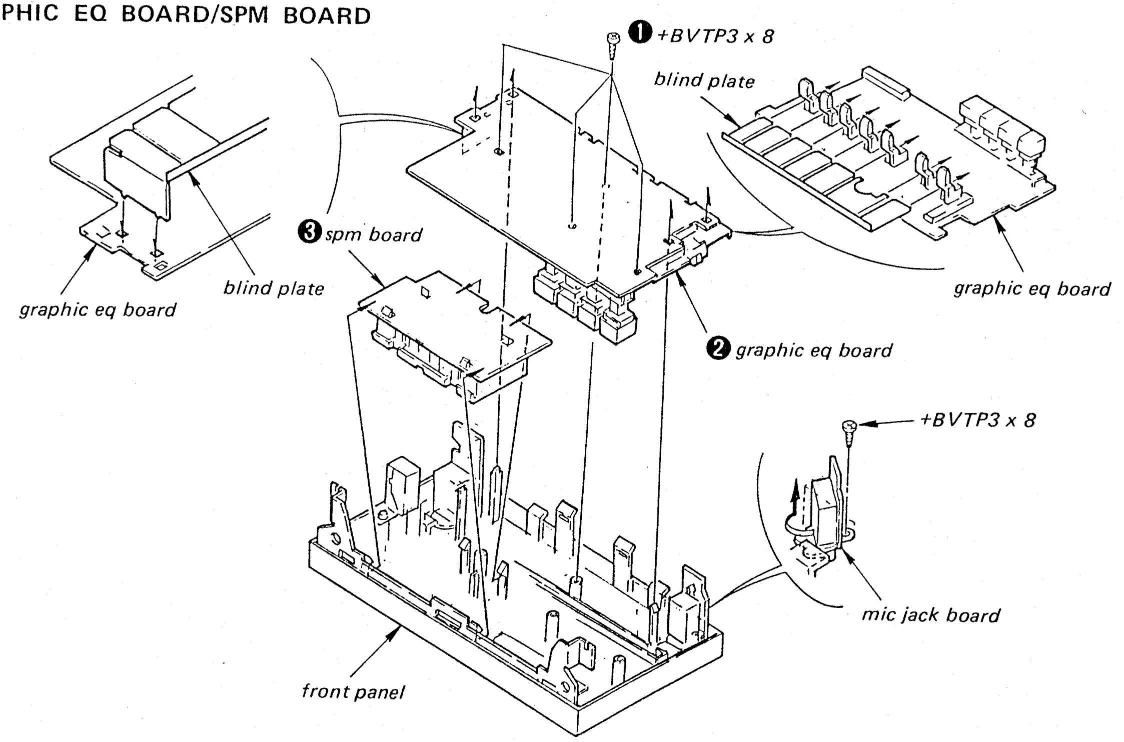
Note: Follow the disassembly procedure in the numerical order given.

Remove the case.
(four screws)

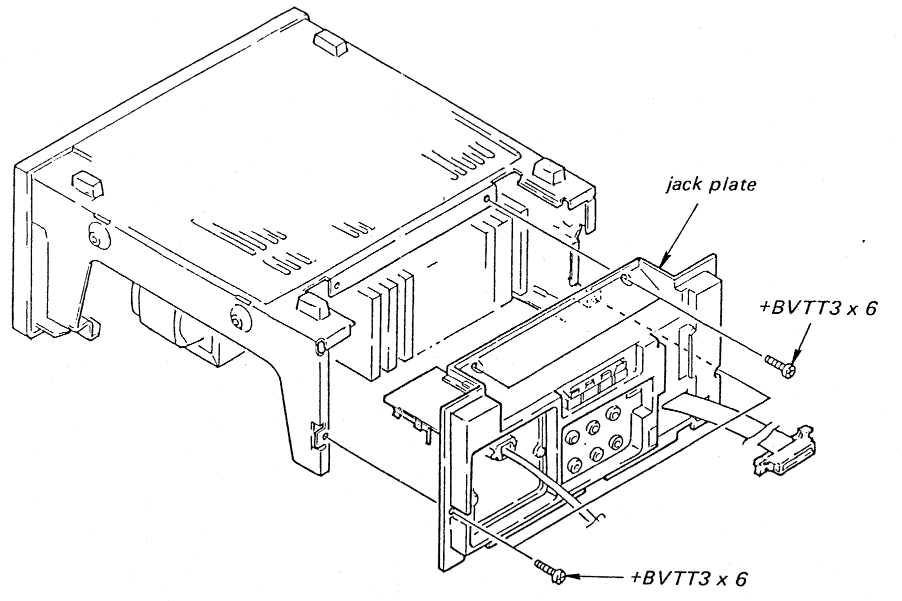
FRONT PANEL


❶ +BVTT3 x 6
❷
front panel

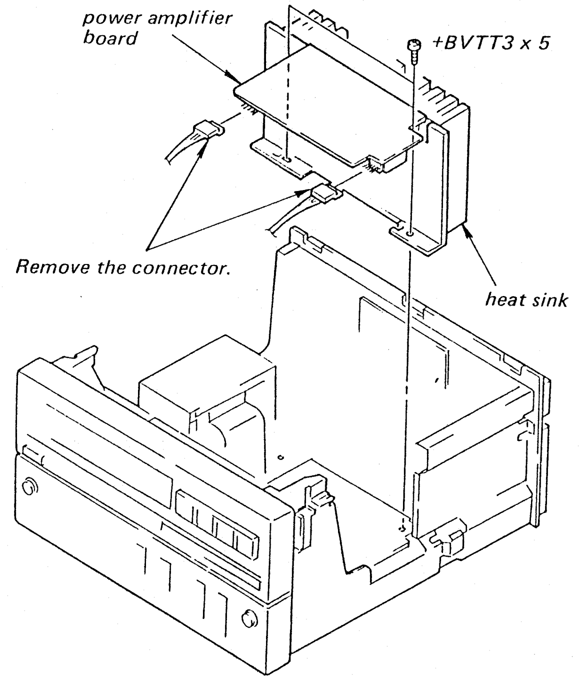
GRAPHIC EQ BOARD/SPM BOARD


❶ +BVTP3 x 8
blind plate
graphic eq board
blind plate
graphic eq board
❸ spm board
❷ graphic eq board
+BVTP3 x 8
mic jack board
front panel

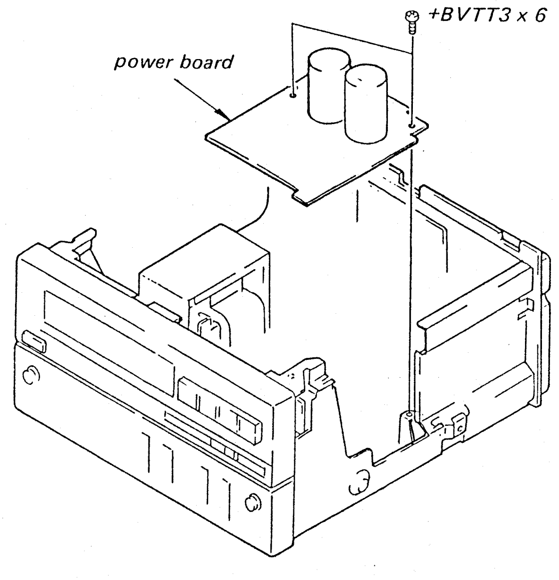
JACK PLATE


jack plate
+BVTT3 x 6
+BVTT3 x 6

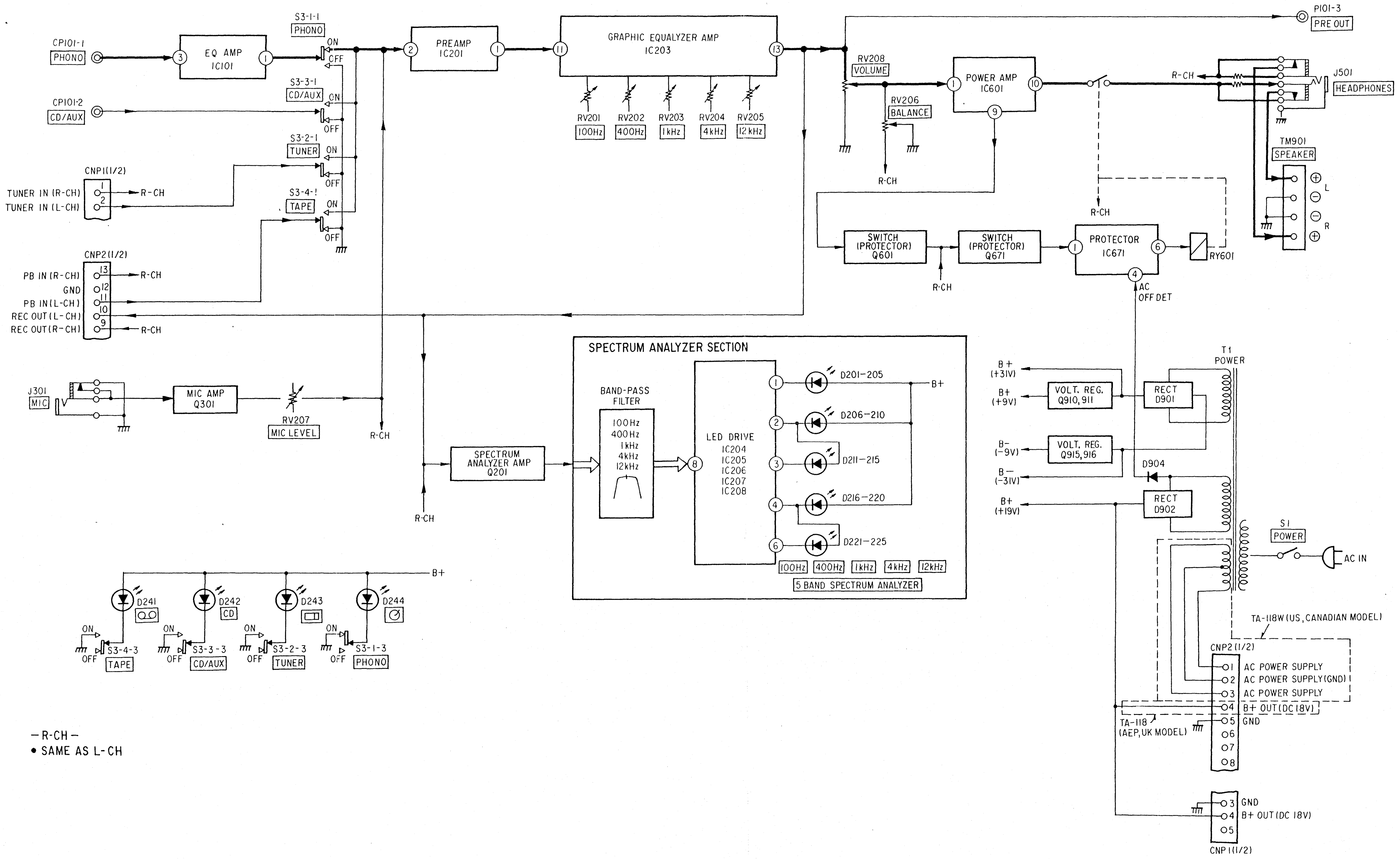
POWER AMPLIFIER BOARD


power amplifier board
+BVTT3 x 5
Remove the connector.
heat sink

POWER BOARD

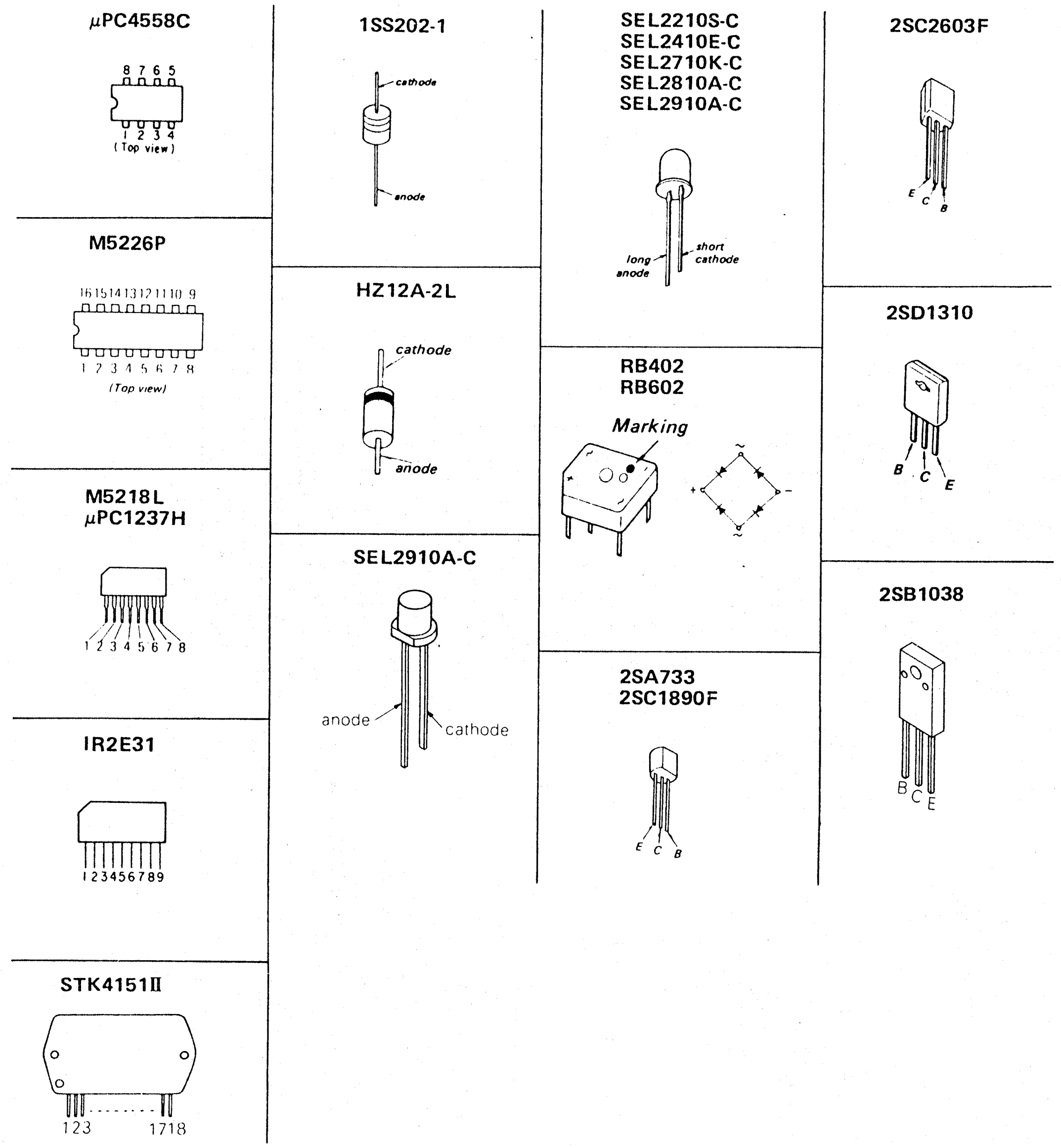

+BVTT3 x 6
power board

2. BLOCK DIAGRAM

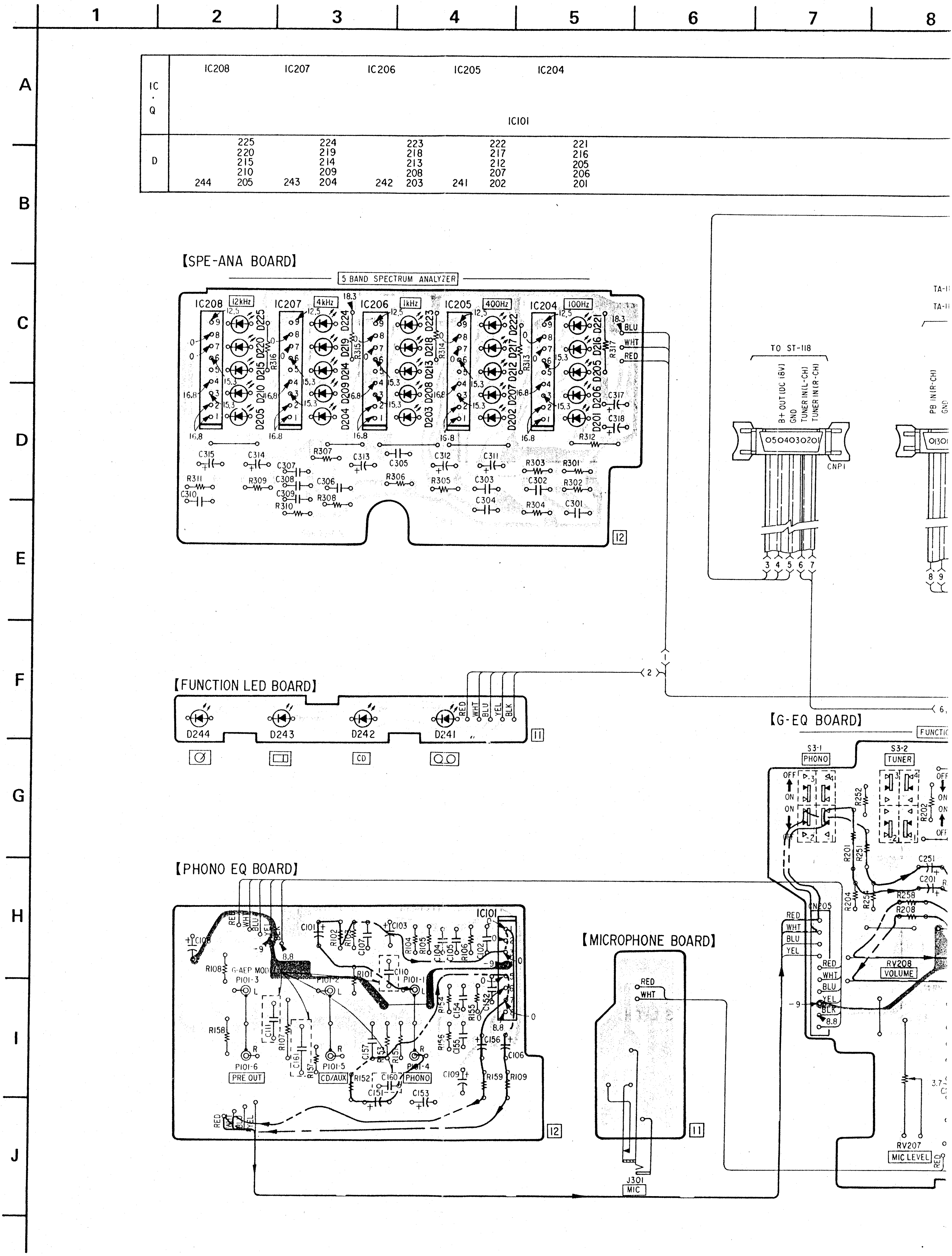

CP101-1
PHONO
EQ AMP
IC101
S3-1-1
PHONO
ON
OFF
PREAMP
IC201
GRAPHIC EQUALIZER AMP
IC203
RV201
100Hz
RV202
400Hz
RV203
1kHz
RV204
4kHz
RV205
12kHz
CP101-2
CD/AUX
S3-3-1
CD/AUX
S3-2-1
TUNER
S3-4-1
TAPE
CNP1(1/2)
TUNER IN (R-CH)
TUNER IN (L-CH)
R-CH
CNP2(1/2)
PB IN (R-CH)
GND
PB IN (L-CH)
REC OUT (L-CH)
REC OUT (R-CH)
13
12
11
10
9
J301
MIC
MIC AMP
Q301
RV207
MIC LEVEL
P101-3
PRE OUT
RV208
VOLUME
RV206
BALANCE
POWER AMP
IC601
J501
HEADPHONES
TM901
SPEAKER
L
R
SWITCH (PROTECTOR) Q601
SWITCH (PROTECTOR) Q671
PROTECTOR
IC671
RY601
AC OFF DET
SPECTRUM ANALYZER SECTION
BAND-PASS FILTER
100Hz
400Hz
1kHz
4kHz
12kHz
SPECTRUM ANALYZER AMP
Q201
LED DRIVE
IC204
IC205
IC206
IC207
IC208
D201–205
D206–210
D211–215
D216–220
D221–225
B+
100Hz 400Hz 1kHz 4kHz 12kHz
5 BAND SPECTRUM ANALYZER
D241
D242
CD
D243
D244
S3-4-3
TAPE
S3-3-3
CD/AUX
S3-2-3
TUNER
S3-1-3
PHONO
B+ (+31V)
B+ (+9V)
B− (−9V)
B− (−31V)
B+ (+19V)
VOLT. REG. Q910, 911
VOLT. REG. Q915, 916
RECT D901
RECT D902
D904
T1
POWER
S1
POWER
AC IN
TA-118W (US, CANADIAN MODEL)
CNP2(1/2)
1 AC POWER SUPPLY
2 AC POWER SUPPLY (GND)
3 AC POWER SUPPLY
4 B+ OUT (DC 18V)
5 GND
6
7
8
TA-118 (AEP, UK MODEL)
3 GND
4 B+ OUT (DC 18V)
5
CNP1(1/2)

−R-CH−
- SAME AS L-CH

- **Semiconductor Lead Layouts**


μPC4558C
8 7 6 5
1 2 3 4
(Top view)
1SS202-1
cathode
anode
SEL2210S-C
SEL2410E-C
SEL2710K-C
SEL2810A-C
SEL2910A-C
long anode
short cathode
2SC2603F
E C B
M5226P
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)
HZ12A-2L
cathode
anode
RB402
RB602
Marking
2SD1310
B C E
M5218L
μPC1237H
1 2 3 4 5 6 7 8
SEL2910A-C
anode
cathode
2SB1038
B C E
IR2E31
1 2 3 4 5 6 7 8 9
2SA733
2SC1890F
E C B
STK4151II
123
1718

3. MOUNTING DIAGRAM



IC·Q		IC208	IC207		IC206	IC205	IC101	IC204	
D	244	225 220 215 210 205	243	224 219 214 209 204	242	223 218 213 208 203	241	222 217 212 207 202	221 216 205 206 201

1
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3
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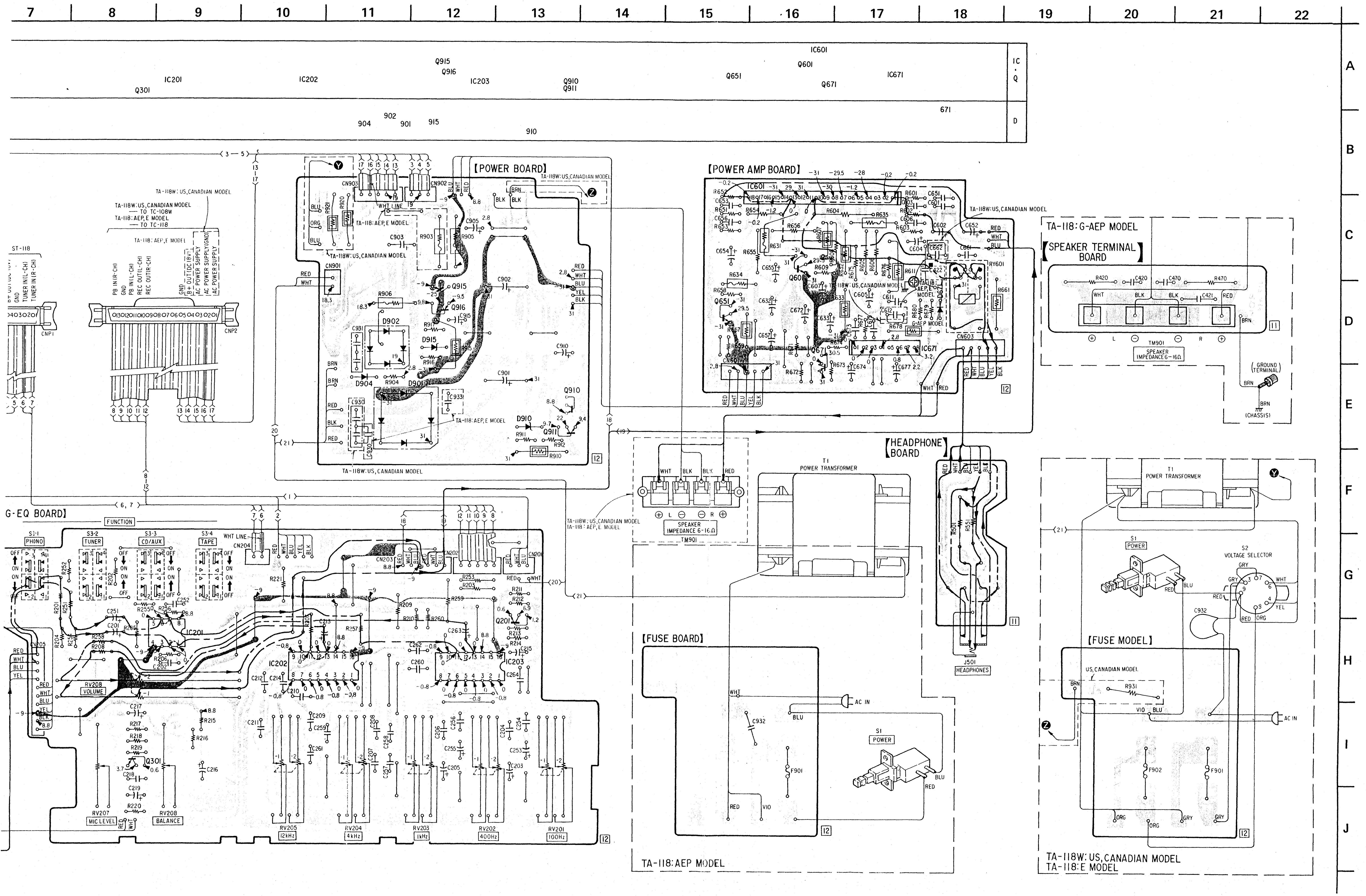
6
7
8
A
B
C
D
E
F
G
H
I
J
【SPE-ANA BOARD】
5 BAND SPECTRUM ANALYZER
IC208
12kHz
IC207
4kHz
IC206
1kHz
IC205
400Hz
IC204
100Hz
BLU
WHT
RED
R317
C317
C318
R312
C315
C314
C307
R307
C313
C305
C312
C311
R303
R301
R311
C310
R309
C308
C309
R310
C306
R308
R306
R305
C303
C304
C302
R302
R304
C301
12
TO ST-118
B+ OUT (DC 16V)
GND
TUNER IN (L-CH)
TUNER IN (R-CH)
CNP1
【FUNCTION LED BOARD】
D244
D243
D242
D241
RED
WHT
BLU
YEL
BLK
11
CD
【G-EQ BOARD】
S3-1
PHONO
S3-2
TUNER
OFF
ON
R252
R202
R201
R251
C251
C201
R204
R254
R258
R208
CN205
RV208
VOLUME
RV207
MIC LEVEL
【PHONO EQ BOARD】
IC101
G-AEP MOD
P101-3
P101-2
P101-1
P101-6
PRE OUT
P101-5
CD/AUX
P101-4
PHONO
R108
R158
C101
C103
C110
C156
C106
C109
C153
C151
C160
R152
R159
R109
12
【MICROPHONE BOARD】
RED
WHT
J301
MIC
11

Note:
- ○—: parts extracted from the component side.
- ■ : part mounted on the conductor side.
- ━━▶━━ : signal path
- ━·━▶ : L-CH signal path
- ━··━▶ : R-CH signal path
- ░ : B + pattern
- ▓ : B – pattern


7
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D
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I
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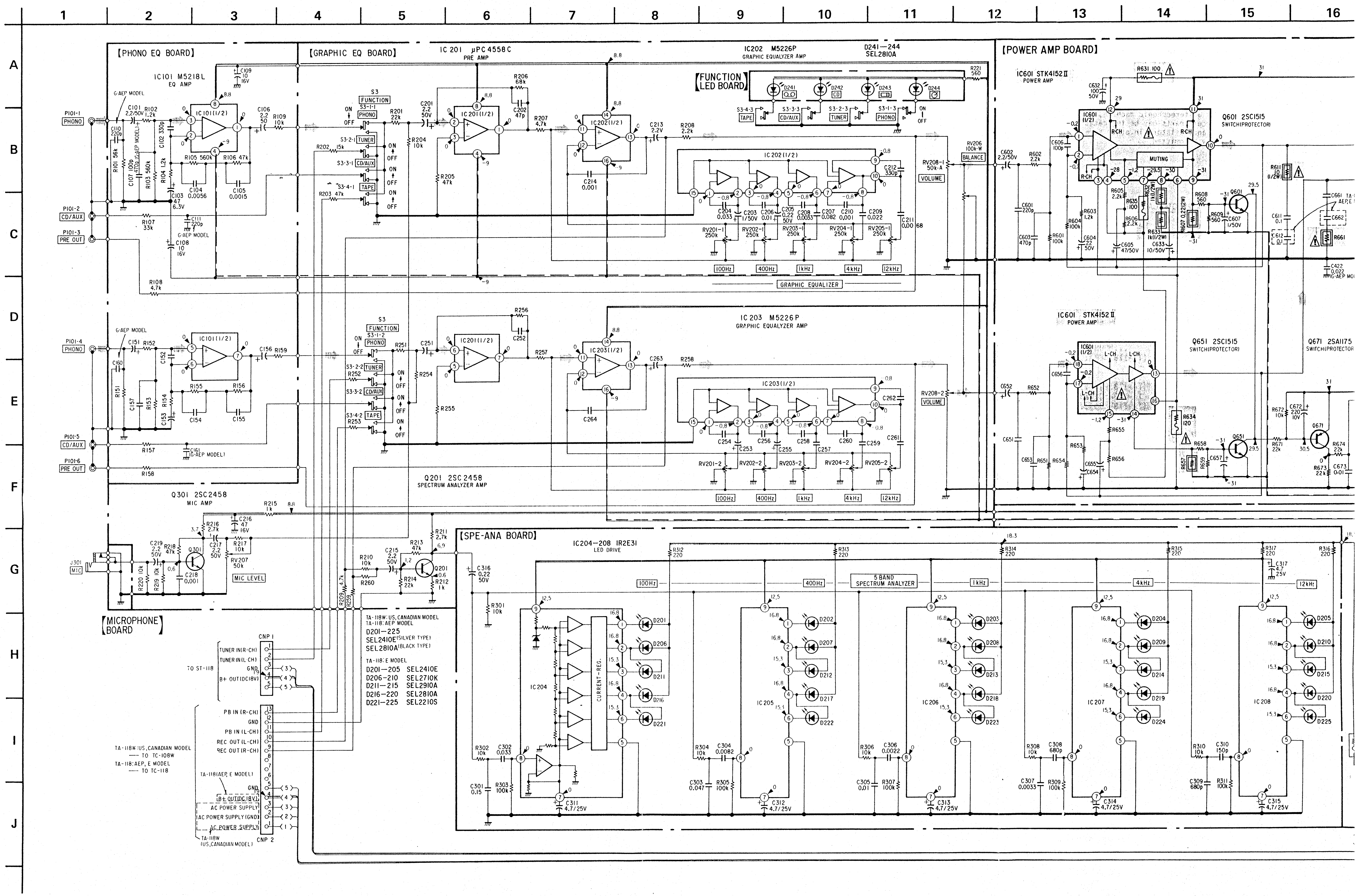
IC Q
D
IC601
Q601
Q651
Q671
IC671
Q915
Q916
IC203
Q910
Q911
IC201
IC202
Q301
671
902
904
901
915
910
【POWER BOARD】
【POWER AMP BOARD】
TA-118W: US, CANADIAN MODEL
TA-118: AEP, E MODEL
TA-118W: US, CANADIAN MODEL — TO TC-108W
TA-118: AEP, E MODEL — TO TC-118
ST-118
CNP1
CNP2
CN901
CN902
CN903
WHT LINE
TA-118: G-AEP MODEL
【SPEAKER TERMINAL BOARD】
TM901
SPEAKER IMPEDANCE 6-16Ω
GROUND TERMINAL
CHASSIS
【HEADPHONE】 BOARD
J501
HEADPHONES
T1 POWER TRANSFORMER
G-EQ BOARD】
FUNCTION
S3-1 PHONO
S3-2 TUNER
S3-3 CD/AUX
S3-4 TAPE
RV208 VOLUME
RV207 MIC LEVEL
RV208 BALANCE
RV205 12kHz
RV204 4kHz
RV203 1kHz
RV202 400Hz
RV201 100Hz
【FUSE BOARD】
AC IN
S1 POWER
F901
F902
C932
S2 VOLTAGE SELECTOR
【FUSE MODEL】
US, CANADIAN MODEL
R931
TA-118: AEP MODEL
TA-118W: US, CANADIAN MODEL
TA-118: E MODEL
RY601
CN603
CN201
CN202
CN203
CN204
CN205

4. SCHEMATIC DIAGRAM


1
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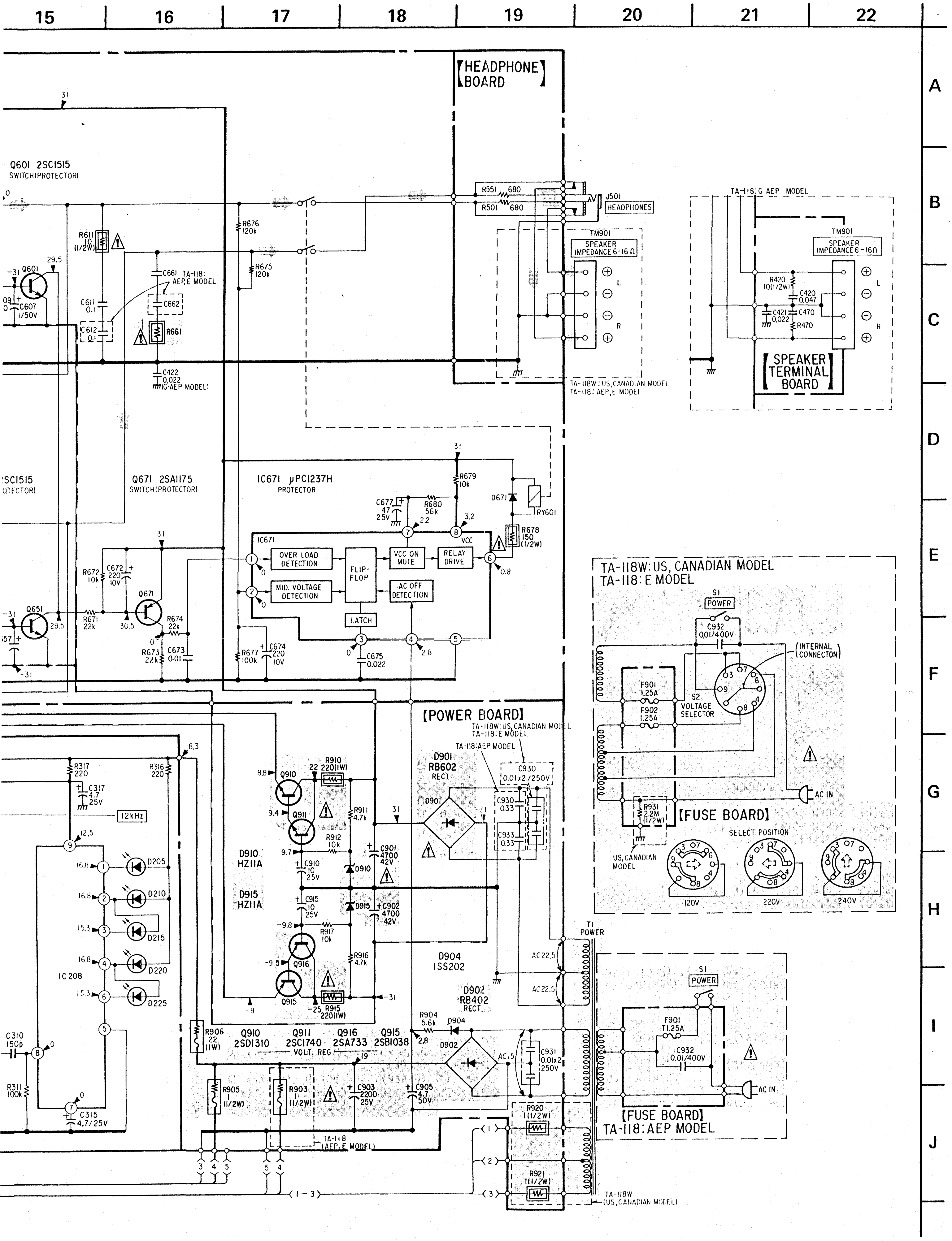
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
[PHONO EQ BOARD]
IC101 M5218L
EQ AMP
G-AEP MODEL
P101-1 PHONO
P101-2 CD/AUX
P101-3 PRE OUT
P101-4 PHONO
P101-5 CD/AUX
P101-6 PRE OUT
[GRAPHIC EQ BOARD]
IC 201 μPC4558C
PRE AMP
S3 FUNCTION
PHONO
TUNER
CD/AUX
TAPE
ON
OFF
IC202 M5226P
GRAPHIC EQUALIZER AMP
D241—244
SEL2810A
[FUNCTION LED BOARD]
D241
D242
D243
D244
RV206 100k-W BALANCE
RV208-1 50k-A VOLUME
RV208-2 VOLUME
100Hz
400Hz
1kHz
4kHz
12kHz
GRAPHIC EQUALIZER
IC 203 M5226P
GRAPHIC EQUALIZER AMP
Q201 2SC2458
SPECTRUM ANALYZER AMP
Q301 2SC2458
MIC AMP
J301 MIC
RV207 50k MIC LEVEL
[MICROPHONE BOARD]
[POWER AMP BOARD]
IC601 STK4152Ⅱ
POWER AMP
R631 100
Q601 2SC1515
SWITCH(PROTECTOR)
MUTING
R-CH
L-CH
Q651 2SC1515
SWITCH(PROTECTOR)
Q671 2SA1175
[SPE-ANA BOARD]
IC204—208 IR2E31
LED DRIVE
5 BAND SPECTRUM ANALYZER
CURRENT-REG.
IC204
IC205
IC206
IC207
IC208
CNP1
TUNER IN(R-CH)
TUNER IN(L-CH)
GND
B+ OUT(DC18V)
TO ST-118
CNP2
PB IN (R-CH)
GND
PB IN (L-CH)
REC OUT (L-CH)
REC OUT (R-CH)
TA-118(AEP, E MODEL)
B+ OUT(DC18V)
AC POWER SUPPLY
AC POWER SUPPLY(GND)
AC POWER SUPPLY
TA-118W (US, CANADIAN MODEL)
TA-118W: US, CANADIAN MODEL — TO TC-108W
TA-118: AEP, E MODEL — TO TC-118

TA-118W: US, CANADIAN MODEL
TA-118: AEP MODEL
D201—225
SEL2410E (SILVER TYPE)
SEL2810A (BLACK TYPE)

TA-118: E MODEL

D201—205	SEL2410E
D206–210	SEL2710K
D211—215	SEL2910A
D216–220	SEL2810A
D221–225	SEL2210S


HEADPHONE BOARD
J501 HEADPHONES
R551 680
R501 680
TM901 SPEAKER IMPEDANCE 6-16Ω
TA-118W: US, CANADIAN MODEL
TA-118: AEP, E MODEL
TA-118: G AEP MODEL
SPEAKER TERMINAL BOARD
Q601 2SC1515 SWITCH(PROTECTOR)
Q671 2SA1175 SWITCH(PROTECTOR)
IC671 μPC1237H PROTECTOR
OVER LOAD DETECTION
MID. VOLTAGE DETECTION
FLIP-FLOP
VCC ON MUTE
RELAY DRIVE
AC OFF DETECTION
LATCH
RY601
POWER BOARD
D901 RB602 RECT
D910 HZ11A
D915 HZ11A
D904 1SS202
D902 RB402 RECT
Q910 2SD1310
Q911 2SC1740
Q916 2SA733
Q915 2SB1038
VOLT. REG
IC 208
12kHz
T1 POWER
TA-118W: US, CANADIAN MODEL
TA-118: E MODEL
S1 POWER
S2 VOLTAGE SELECTOR
INTERNAL CONNECTON
F901 1.25A
F902 1.25A
AC IN
FUSE BOARD
SELECT POSITION
US, CANADIAN MODEL
120V
220V
240V
FUSE BOARD
TA-118: AEP MODEL
F901 T1.25A
C932 0.01/400V
R920
R921
TA-118W (US, CANADIAN MODEL)
15
16
17
18
19
20
21
22
A
B
C
D
E
F
G
H
I
J

Note:
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- ⇨ : signal path.
- Components for right channel have same values as for left channel. Reference numbers are coded from 150, 250, and 650.
- : nonflammable resistor.
- : fusible resistor.
- Switch

Ref. No.	Switch	Position
S1	POWER	OFF
S2	VOLTAGE SELECTOR	–
S3-1	PHONO	ON
S3-2	TUNER	OFF
S3-3	CD/AUX	OFF
S3-4	TAPE	OFF

- ▬▬ : B+ bus.
- ▬ ▬ ▬ : B– bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

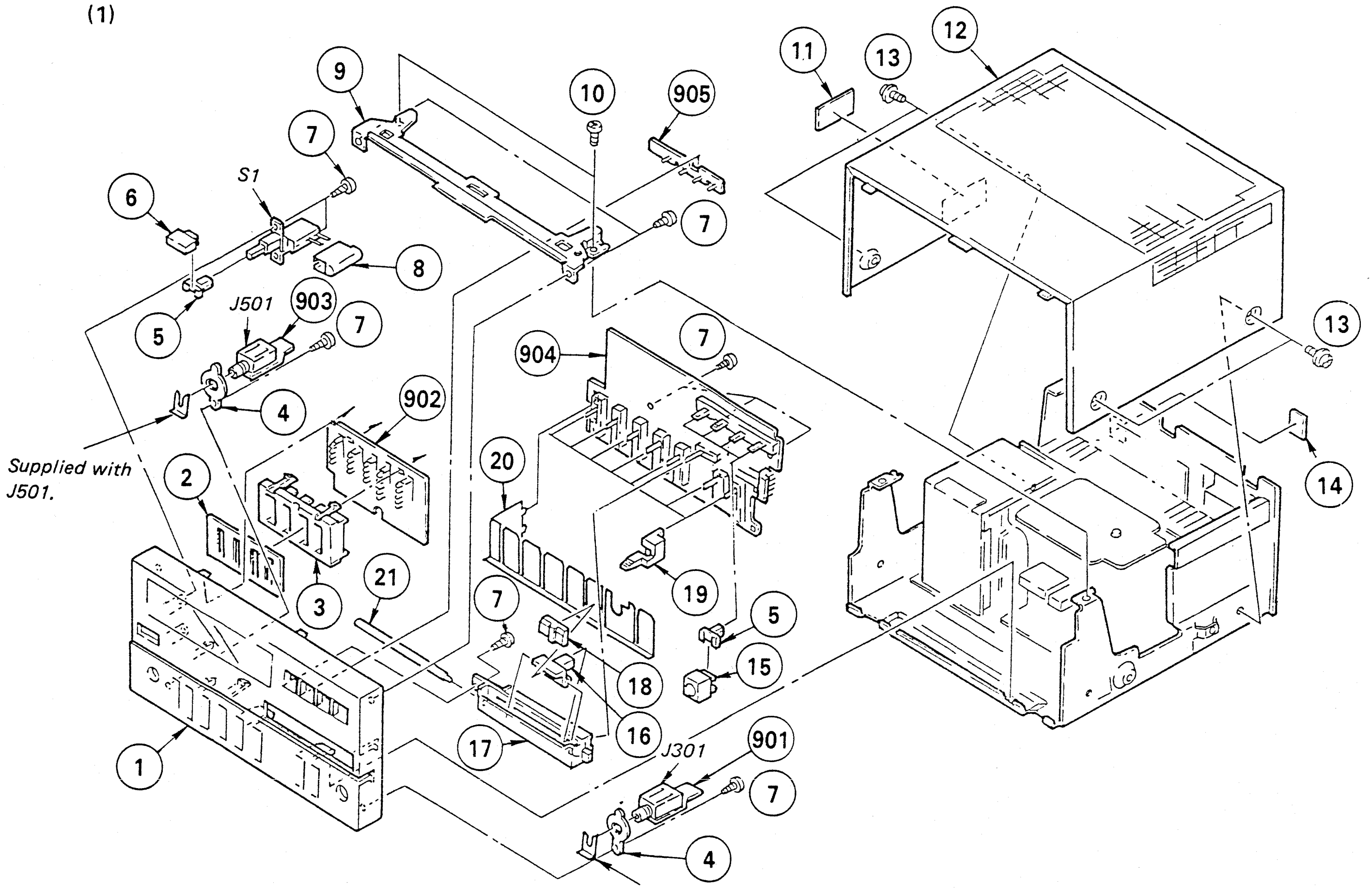
5. EXPLODED VIEWS AND PARTS LIST

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

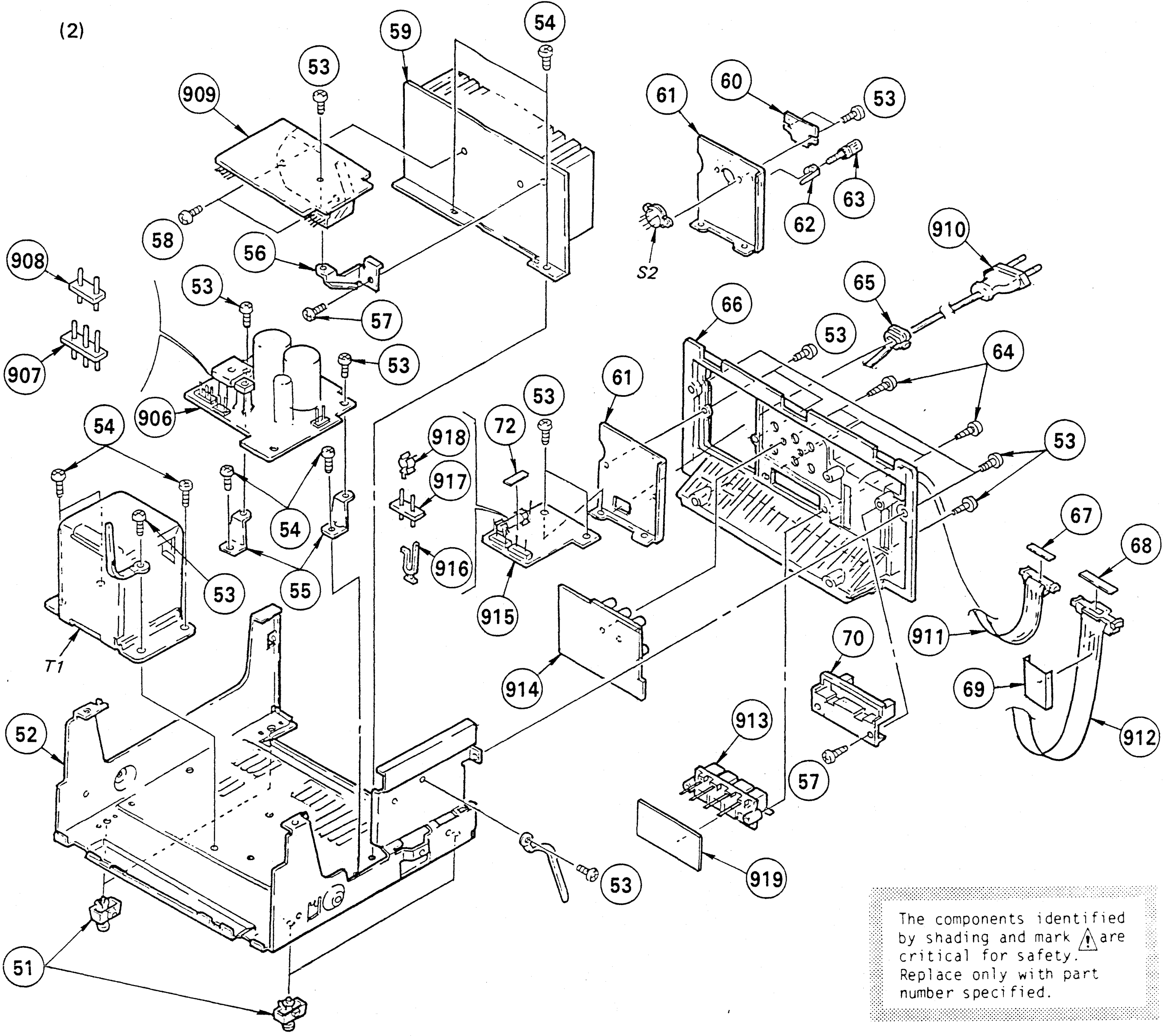
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

(1)



No.	Part No.	Description	REMARKS
1	X-4910-016-1	(SILVER)(TA-118:AEP)...PANEL ASSY, FRONT	
	X-4910-016-2	(BLACK)(TA-118:AEP)....PANEL ASSY, FRONT	
	X-4910-035-2	(BLACK)(TA-118W:US,Canadian)..PANEL ASSY, FRONT	
	X-4910-036-1	(SILVER)(TA-118:E)...PANEL ASSY, FRONT	
	X-4910-036-2	(BLACK)(TA-118:E)....PANEL ASSY, FRONT	
2	*4-909-975-01	(SILVER)...PLATE (5 GANG), INDICATION	
	*4-909-975-11	(BLACK)....PLATE (5 GANG), INDICATION	
3	*4-909-976-01	HOUSE (5 GANG), LAMP	
4	*4-910-065-01	BRACKET, JACK	
5	4-910-058-01	JOINT, KNOB	
6	4-910-056-01	(SILVER)...KNOB, POWER	
	4-910-056-11	(BLACK)....KNOB, POWER	
7	7-685-646-71	SCREW +BVTP 3X8 TYPE2 SLIT	
8	3-575-524-00	COVER, POWER SWITCH	
9	*4-910-068-01	JOINT	
10	7-685-871-01	SCREW +BVTT 3X6 (S)	
11	*4-910-009-01	(TA-118:E)...........LABEL, MODEL NUMBER	
	*4-910-010-01	(TA-118:AEP).........LABEL, MODEL NUMBER	
	*4-910-013-01	(TA-118:G-AEP).......LABEL, MODEL NUMBER	
	*4-910-341-01	(TA-11W:US)...LABEL, MODEL NUMBER (U)	
	*4-910-342-01	(TA-118W:Canadian)...LABEL, MODEL NUMBER	
12	4-910-078-21	(SILVER)...CASE	
	4-910-078-31	(BLACK)....CASE	
13	4-886-821-01	(BLACK)....SCREW, M3 CASE	
	4-886-821-11	(SILVER)...SCREW, M3 CASE	
14	*3-703-680-00	(TA-118W:US)..LABEL, CAUTION, SUB, NEW UL	
15	4-910-057-01	(SILVER)...KNOB, SQUARE	
	4-910-057-11	(BLACK)....KNOB, SQUARE	
16	*4-910-061-01	(SILVER)...JOINT, CONTROL	
	*4-910-061-11	(BLACK)....JOINT, CONTROL	
17	*4-910-074-01	(SILVER)...HOUSE, CONTROL	
	*4-910-074-11	(BLACK)....HOUSE, CONTROL	
18	4-910-075-01	(SILVER)...KNOB, CONTROL	
	4-910-075-11	(BLACK)....KNOB, CONTROL	
19	4-909-977-11	(SILVER)...KNOB, GRAPHIC EQUALIZER	
	4-909-977-21	(BLACK)....KNOB, GRAPHIC EQUALIZER	
20	*4-910-076-01	PLATE (L/M), BLIND	
21	*4-910-062-01	SHAFT, SLIDE	
901	*1-615-445-11	PC BOARD, MICROPHONE	
902	*1-615-444-11	PC BOARD, SPE-ANA	
903	*1-615-446-11	PC BOARD, HEADPHONE	
904	*A-4375-210-A	MOUNTED PCB, EQ, GRAPHIC	
905	*1-615-448-11	PC BOARD, FUNCTION LED	
J301	1-507-857-00	JACK, LARGE TYPE (MICROPHONE)	
J501	1-507-849-00	JACK, LARGE TYPE (HEADPHONES)	
S1	⚠.1-553-318-51	SWITCH, PUSH (AC POWER)(1 KEY)	

(2)



The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	REMARKS
51	X-4902-937-1	FOOT ASSY, RUBBER	
52	*4-902-974-01	CHASSIS	
53	7-685-871-01	SCREW +BVTT 3X6 (S)	
54	7-682-546-04	SCREW +BVTT 3X5 (S)	
55	*4-910-060-01	BRACKET, PC BOARD	
56	*4-910-064-01	BRACKET (H), PC BOARD	
57	7-685-646-71	SCREW +BVTP 3X8 TYPE2 N-S	
58	7-685-650-21	SCREW +BVTP 3X16 TYPE2 SLIT	
59	*4-910-077-01	HEAT SINK	
60	*4-910-063-01	(TA-118W:US,Canadian)...COVER (H/M), VS	
61	*4-910-073-10	(TA-118:AEP)...BRACKET, INLET	
	*4-910-073-11	(TA-118W:US,Canadian)(TA-118:E) ...BRACKET, INLET	
62	3-701-993-00	(TA-118:G-AEP)...SPACER, TERMINAL	
63	3-706-165-00	(TA-118:G-AEP)...SCREW	
64	7-685-647-14	SCREW +BVTP 3X10 TYPE2 N-S	
65	3-703-571-00	(TA-118W:US)(TA-118:E)...BUSHING (S)(4516), CORD	
	3-703-244-00	(TA-118W:Canadian)(TA-118:AEP) ...BUSHING, CORD	
66	4-910-079-01	PLATE, JACK	
67	*4-910-066-01	(TA-118:AEP)...LABEL (A), CONNECTOR	
68	*4-910-067-01	(TA-118:AEP)...LABEL (B), CONNECTOR	
69	4-884-875-00	LABEL (A) (CONNECTOR), CAUTION	
70	*4-884-826-11	HOLDER (A), WIRE	
71	*3-701-748-00	CLAMP	
72	*3-701-946-21	(TA-118W:US,Canadian)...LABEL, FUSE	

No.	Part No.	Description	REMARKS
906	*1-615-440-11	PC BOARD, POWER	
907	*1-535-116-00	TERMINAL 3P	
908	*1-535-115-00	TERMINAL 2P	
909	*A-4388-446-A	(TA-118W:US,Canadian TA-118:E)... MOUNTED PCB, POWER AMPLIFIER	
	*A-4388-474-A	(TA-118:AEP)...MOUNTED PCB, POWER AMPLIFIER	
910	⚠.1-551-472-00	(TA-118:E)..........CORD, POWER	
	⚠.1-551-511-00	(TA-118W:Canadian)...CORD, POWER	
	⚠.1-551-628-00	(TA-118W:US).........CORD, POWER	
	⚠.1-554-817-XX	(TA-118:AEP).........CORD, POWER	
911	1-557-896-11	CORD (WITH CONNECTOR)(5P)	
912	1-557-897-11	CORD (WITH CONNECTOR)(13P)	
913	1-536-705-21	TERMINAL BOARD (SP)	
914	*1-615-443-11	PC BOARD, PHONO EQ	
915	*1-615-442-11	PC BOARD, FUSE	
916	1-535-416-00	TERMINAL	
917	*1-535-139-00	BASE POST 22MM (10MM PITCH) 2P	
918	1-533-162-00	HOLDER, FUSE	
919	*1-616-486-11	(G·AEP)...PC BOARD, SPEAKER TERMINAL	
S2	⚠.1-526-576-51	(TA-118W:US,Canadian)(TA-118:E)... SELECTOR, POWER VOLTAGE	
T1	⚠.1-448-133-11	(TA-118:E)............TRANSFORMER, POWER	
T1	⚠.1-448-134-11	(TA-118:AEP)..........TRANSFORMER, POWER	
T1	⚠.1-448-257-11	(TA-118W:US,Canadian)..TRANSFORMER, POWER	

6. ELECTRICAL PARTS LIST

NOTE:

- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	*1-615-445-11	PC BOARD, MICROPHONE			
902	*1-615-444-11	PC BOARD, SPE-ANA			
903	*1-615-446-11	PC BOARD, HEADPHONE			
904	*A-4375-210-A	MOUNTED PCB, EQ, GRAPHIC			
905	*1-615-448-11	PC BOARD, FUNCTION LED			
906	*1-615-440-11	PC BOARD, POWER			
907	*1-535-116-00	TERMINAL 3P			
908	*1-535-115-00	TERMINAL 2P			
909	*A-4388-446-A	(TA-118W:US,Canadian TA-118:E)... ...MOUNTED PCB, POWER AMPLIFIER			
	*A-4388-474-A	(TA-118:AEP)...MOUNTED PCB, POWER AMPLIFIER			
910	⚠.1-551-472-00	(TA-118:E)..........CORD, POWER			
	⚠.1-551-511-00	(TA-118W:Canadian)...CORD, POWER			
	⚠.1-551-628-00	(TA-118W:US).........CORD, POWER			
	⚠.1-554-817-XX	(TA-118:AEP).........CORD, POWER			
911	1-557-896-11	CORD (WITH CONNECTOR)(5P)			
912	1-557-897-11	CORD (WITH CONNECTOR)(13P)			
913	1-536-705-21	TERMINAL BOARD (SP)			
914	*1-615-443-11	PC BOARD, PHONO EQ			
915	*1-615-442-11	PC BOARD, FUSE			
916	1-535-416-00	TERMINAL			
917	*1-535-139-00	BASE POST 22MM (10MM PITCH) 2P			
918	1-533-162-00	HOLDER, FUSE			
919	*1-616-486-11	(G-AEP)....PC BOARD, SPEAKER TERMINAL			
C101	1-123-612-00	ELECT	2.2MF	20%	50V
C102	1-162-288-31	CERAMIC	330PF	10%	50V
C103	1-123-647-00	ELECT	47MF	20%	6.3V
C104	1-130-480-00	MYLAR	0.0056MF	5%	50V
C105	1-130-473-00	MYLAR	0.0015MF	5%	50V
C106	1-123-612-00	ELECT	2.2MF	20%	50V
C107	1-162-282-31	(US,Canadian,AEP,E) .....CERAMIC	100PF	10%	50V
C107	1-162-290-31	(G-AEP).....CERAMIC	470PF	10%	50V
C108	1-123-617-00	ELECT	10MF	20%	16V
C109	1-123-617-00	ELECT	10MF	20%	16V
C110	1-162-286-31	(G-AEP)....CERAMIC	220PF	10%	50V
C111	1-162-286-31	(G-AEP)....CERAMIC	220PF	10%	50V
C151	1-123-612-00	ELECT	2.2MF	20%	50V
C152	1-162-288-31	CERAMIC	330PF	10%	50V
C153	1-123-647-00	ELECT	47MF	20%	6.3V
C154	1-130-480-00	MYLAR	0.0056MF	5%	50V
C155	1-130-473-00	MYLAR	0.0015MF	5%	50V
C156	1-123-612-00	ELECT	2.2MF	20%	50V
C157	1-162-282-31	(US,Canadian,AEP,E) .....CERAMIC	100PF	10%	50V
C157	1-162-290-31	(G-AEP).....CERAMIC	470PF	10%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C160	1-162-286-31	(G-AEP)....CERAMIC	220PF	10%	50V
C161	1-162-286-31	(G-AEP)....CERAMIC	220PF	10%	50V
C201	1-123-612-00	ELECT	2.2MF	20%	50V
C202	1-162-215-31	CERAMIC	47PF	5%	50V
C203	1-123-611-00	ELECT	1MF	20%	50V
C204	1-136-159-00	MYLAR	0.033MF	10%	50V
C205	1-123-608-00	ELECT	0.22MF	20%	50V
C206	1-136-153-00	MYLAR	0.01MF	10%	50V
C207	1-136-164-00	MYLAR	0.082MF	10%	50V
C208	1-102-123-00	CERAMIC	0.0033MF	10%	50V
C209	1-136-157-00	MYLAR	0.022MF	10%	50V
C210	1-162-294-31	CERAMIC	0.001MF	10%	50V
C211	1-102-127-00	CERAMIC	0.0068MF	10%	50V
C212	1-162-288-31	CERAMIC	330PF	10%	50V
C213	1-123-612-00	ELECT	2.2MF	20%	50V
C214	1-162-294-31	CERAMIC	0.001MF	10%	50V
C215	1-123-612-00	ELECT	2.2MF	20%	50V
C216	1-123-332-00	ELECT	47MF	20%	16V
C217	1-123-612-00	ELECT	2.2MF	20%	50V
C218	1-162-294-31	CERAMIC	0.001MF	10%	50V
C219	1-123-612-00	ELECT	2.2MF	20%	50V
C251	1-123-612-00	ELECT	2.2MF	20%	50V
C252	1-162-215-31	CERAMIC	47PF	5%	50V
C253	1-123-611-00	ELECT	1MF	20%	50V
C254	1-136-159-00	MYLAR	0.033MF	10%	50V
C255	1-123-608-00	ELECT	0.22MF	20%	50V
C256	1-136-153-00	MYLAR	0.01MF	10%	50V
C257	1-136-164-00	MYLAR	0.082MF	10%	50V
C258	1-102-123-00	CERAMIC	0.0033MF	10%	50V
C259	1-136-157-00	MYLAR	0.022MF	10%	50V
C260	1-162-294-31	CERAMIC	0.001MF	10%	50V
C261	1-102-127-00	CERAMIC	0.0068MF	10%	50V
C262	1-162-288-31	CERAMIC	330PF	10%	50V
C263	1-123-612-00	ELECT	2.2MF	20%	50V
C264	1-162-294-31	CERAMIC	0.001MF	10%	50V
C301	1-130-497-00	MYLAR	0.15MF	10%	50V
C302	1-136-159-00	MYLAR	0.033MF	10%	50V
C303	1-136-161-00	MYLAR	0.047MF	10%	50V
C304	1-130-029-00	MYLAR	0.0082MF	10%	50V
C305	1-136-153-00	MYLAR	0.01MF	10%	50V
C306	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C307	1-102-123-00	CERAMIC	0.0033MF	10%	50V
C308	1-162-292-31	CERAMIC	680PF	10%	50V
C309	1-162-292-31	CERAMIC	680PF	10%	50V
C310	1-162-284-31	CERAMIC	150PF	10%	50V
C311	1-123-616-00	ELECT	4.7MF	20%	25V
C312	1-123-616-00	ELECT	4.7MF	20%	25V
C313	1-123-616-00	ELECT	4.7MF	20%	25V
C314	1-123-616-00	ELECT	4.7MF	20%	25V

ELECTRICAL PARTS

Ref.No.	Part No.	Description
C315	1-123-616-00	ELECT 4.7MF 20% 25V
C316	1-123-608-00	ELECT 0.22MF 20% 50V
C317	1-123-616-00	ELECT 4.7MF 20% 25V
C420	1-136-161-00	(G-AEP)...FILM 0.047MF 5% 50V
C421	1-161-494-00	(G-AEP)...CERAMIC 0.022MF 30% 25V
C422	1-161-494-00	(G-AEP)...CERAMIC 0.022MF 30% 25V
C470	1-136-161-00	(G-AEP)...FILM 0.047MF 5% 50V
C601	1-162-286-31	CERAMIC 220PF 10% 50V
C602	1-123-381-00	ELECT 2.2MF 20% 50V
C603	1-162-290-31	CERAMIC 470PF 10% 50V
C604	1-123-357-00	ELECT 22MF 20% 50V
C605	1-123-359-00	ELECT 47MF 20% 50V
C606	1-162-282-31	CERAMIC 100PF 10% 50V
C607	1-123-380-00	ELECT 1MF 20% 50V
C611	1-136-165-00	FILM 0.1MF 5% 50V
C612	1-136-165-00	(TA-118:AEP,E)...FILM 0.1MF 5% 50V
C632	1-123-360-00	ELECT 100MF 20% 50V
C633	1-123-356-00	ELECT 10MF 20% 50V
C651	1-162-286-31	CERAMIC 220PF 10% 50V
C652	1-123-381-00	ELECT 2.2MF 20% 50V
C653	1-162-290-31	CERAMIC 470PF 10% 50V
C654	1-123-357-00	ELECT 22MF 20% 50V
C655	1-123-359-00	ELECT 47MF 20% 50V
C656	1-162-282-31	CERAMIC 100PF 10% 50V
C657	1-123-380-00	ELECT 1MF 20% 50V
C661	1-136-165-00	FILM 0.1MF 5% 50V
C662	1-136-165-00	(TA-118:AEP,E)...FILM 0.1MF 5% 50V
C672	1-123-308-00	ELECT 220MF 20% 10V
C673	1-162-306-31	CERAMIC 0.01MF 30% 16V
C674	1-123-308-00	ELECT 220MF 20% 10V
C675	1-136-157-00	FILM 0.022MF 5% 50V
C677	1-123-332-00	ELECT 47MF 20% 25V
C901	⚠.1-124-362-00	ELECT 4700MF 20% 42V
C902	⚠.1-124-362-00	ELECT 4700MF 20% 42V
C903	⚠.1-123-338-00	ELECT 2200MF 20% 25V
C905	⚠.1-123-369-00	ELECT 4.7MF 20% 50V
C910	1-123-356-00	ELECT 10MF 20% 25V
C915	1-123-356-00	ELECT 10MF 20% 25V
C930	1-102-394-00	(TA-118W:US,Canadian)(TA-118:E)... CERAMIC 0.01MFX2 250V
C930	1-136-171-00	(TA-118:AEP)...FILM 0.33MF 5% 50V
C931	1-102-394-00	CERAMIC 0.01MFX2 250V
C932	⚠.1-161-744-00	CERAMIC 0.01MF 400V
C933	1-136-171-00	(TA-118:AEP)...FILM 0.33MF 5% 50V
CN201	*1-564-112-21	PIN, CONNECTOR 3P
CN202	*1-564-114-11	PIN, CONNECTOR 5P
CN203	*1-564-115-00	PIN, CONNECTOR 6P
CN204	*1-564-111-00	PIN, CONNECTOR 2P
CN205	*1-560-077-00	PIN, CONNECTOR
CN301	*1-564-111-00	PIN, CONNECTOR 2P
CN601	*1-560-070-00	BASE POST
CN603	*1-560-070-00	BASE POST
CN901	*1-560-708-00	PIN, CONNECTOR 2P
CN902	*1-560-602-00	PIN, CONNECTOR 3P
CN903	*1-560-604-00	PIN, CONNECTOR 5P
D201	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D201	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D201	8-719-301-43	(E)...DIODE SEL2410E-C

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D202	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D202	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D202	8-719-301-43	(E)...DIODE SEL2410E-C
D203	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D203	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D203	8-719-301-43	(E)...DIODE SEL2410E-C
D204	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D204	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D204	8-719-301-43	(E)...DIODE SEL2410E-C
D205	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D205	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D205	8-719-301-43	(E)...DIODE SEL2410E-C
D206	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D206	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D206	8-719-300-95	(E)...DIODE SEL2710K-C
D207	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D207	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D207	8-719-300-95	(E)...DIODE SEL2710K-C
D208	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D208	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D208	8-719-300-95	(E)...DIODE SEL2710K-C
D209	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D209	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D209	8-719-300-95	(E)...DIODE SEL2710K-C
D210	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D210	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D210	8-719-300-95	(E)...DIODE SEL2710K-C
D211	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D211	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D211	8-719-301-60	(E)...DIODE SEL2910A-C
D212	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D212	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D212	8-719-301-60	(E)...DIODE SEL2910A-C
D213	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D213	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D213	8-719-301-60	(E)...DIODE SEL2910A-C
D214	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D214	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D214	8-719-301-60	(E)...DIODE SEL2910A-C

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D215	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D215	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D215	8-719-301-60	(E)...DIODE SEL2910A-C
D216	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D216	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D216	8-719-301-52	(E)...DIODE SEL2810A-C
D217	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D217	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D217	8-719-301-52	(E)...DIODE SEL2810A-C
D218	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D218	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D218	8-719-301-52	(E)...DIODE SEL2810A-C
D219	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D219	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D219	8-719-301-52	(E)...DIODE SEL2810A-C
D220	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D220	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D220	8-719-301-52	(E)...DIODE SEL2810A-C
D221	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D221	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D221	8-719-301-38	(E)...DIODE SEL2210S-C
D222	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D222	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D222	8-719-301-38	(E)...DIODE SEL2210S-C
D223	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D223	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D223	8-719-301-38	(E)...DIODE SEL2210S-C
D224	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D224	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D224	8-719-301-38	(E)...DIODE SEL2210S-C
D225	8-719-301-43	(SILVER:US,Canadian,AEP)... DIODE SEL2410E-C
D225	8-719-301-52	(BLACK:US,Canadian,AEP).... DIODE SEL2810A-C
D225	8-719-301-38	(E)...DIODE SEL2210S-C
D241	8-719-301-52	DIODE SEL2810A-C
D242	8-719-301-52	DIODE SEL2810A-C
D243	8-719-301-52	DIODE SEL2810A-C
D244	8-719-301-52	DIODE SEL2810A-C

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ELECTRICAL PARTS

Ref.No.	Part No.	Description
D671	8-719-107-94	DIODE 1SS202-1
D901	⚠.8-719-301-65	DIODE RB602
D902	⚠.8-719-300-57	DIODE RB402
D904	8-719-107-94	DIODE 1SS202-1
D910	⚠.8-719-910-12	DIODE HZ11A2L
D915	⚠.8-719-910-12	DIODE HZ11A2L
DIP101	*1-562-249-00	SOCKET, CONNECTOR 4P
DIP102	*1-562-250-00	SOCKET, CONNECTOR 5P
DIP902	*1-562-327-00	SOCKET, CONNECTOR 3P
DIP903	*1-562-250-00	SOCKET, CONNECTOR 5P
F901	⚠.1-532-285-00	(TA-118:AEP,E).....FUSE, TIME LAG 1.25A
F901	⚠.1-532-570-00	(TA-118W:US,Canadian)..FUSE, GLASS TUBE
F902	⚠.1-532-285-00	(TA-118:E).........FUSE, TIME LAG 1.25A
F902	⚠.1-532-570-00	(TA-118W:US,Canadian)..FUSE, GLASS TUBE
IC101	8-759-600-02	IC M5218L
IC102	8-759-145-58	IC UPC4558C
IC202	8-759-602-04	IC M5226P
IC203	8-759-602-04	IC M5226P
IC204	8-759-913-80	IC IR2E31
IC205	8-759-913-80	IC IR2E31
IC206	8-759-913-80	IC IR2E31
IC207	8-759-913-80	IC IR2E31
IC208	8-759-913-80	IC IR2E31
IC601	⚠.8-749-941-52	IC STK4152II
IC671	8-759-101-23	IC UPC1237H
J301	1-507-857-00	JACK, LARGE TYPE (MICROPHONE)
J501	1-507-849-00	JACK, LARGE TYPE (HEADPHONES)
P101	1-507-914-21	JACK, PIN 6P (PHONO,AUX,PRE OUT)
Q201	8-729-606-33	TRANSISTOR 2SC2603F
Q301	8-729-606-33	TRANSISTOR 2SC2603F
Q601	8-729-255-12	TRANSISTOR 2SC1890F
Q651	8-729-255-12	TRANSISTOR 2SC1890F
Q671	8-729-173-37	TRANSISTOR 2SA733
Q910	⚠.8-729-103-33	TRANSISTOR 2SD1310
Q911	⚠.8-729-606-33	TRANSISTOR 2SC2603F
Q915	⚠.8-729-103-48	TRANSISTOR 2SB1038
Q916	⚠.8-729-173-37	TRANSISTOR 2SA733
R101	1-247-873-00	CARBON 56K 5% 1/6W
R102	1-247-833-00	CARBON 1.2K 5% 1/6W
R103	1-247-897-00	CARBON 560K 5% 1/6W
R104	1-247-833-00	CARBON 1.2K 5% 1/6W
R105	1-247-897-00	CARBON 560K 5% 1/6W
R106	1-247-871-00	CARBON 47K 5% 1/6W
R107	1-247-867-00	CARBON 33K 5% 1/6W
R108	1-247-847-00	CARBON 4.7K 5% 1/6W
R109	1-247-855-00	CARBON 10K 5% 1/6W
R151	1-247-873-00	CARBON 56K 5% 1/6W
R152	1-247-833-00	CARBON 1.2K 5% 1/6W
R153	1-247-897-00	CARBON 560K 5% 1/6W
R154	1-247-833-00	CARBON 1.2K 5% 1/6W
R155	1-247-897-00	CARBON 560K 5% 1/6W
R156	1-247-871-00	CARBON 47K 5% 1/6W
R157	1-247-867-00	CARBON 33K 5% 1/6W
R158	1-247-847-00	CARBON 4.7K 5% 1/6W
R159	1-247-855-00	CARBON 10K 5% 1/6W
R201	1-247-863-00	CARBON 22K 5% 1/6W
R202	1-247-859-00	CARBON 15K 5% 1/6W
R203	1-247-871-00	CARBON 47K 5% 1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R204	1-247-855-00	CARBON	10K	5%	1/6W	
R205	1-247-871-00	CARBON	47K	5%	1/6W	
R206	1-247-875-00	CARBON	68K	5%	1/6W	
R207	1-247-847-00	CARBON	4.7K	5%	1/6W	
R208	1-247-839-00	CARBON	2.2K	5%	1/6W	
R209	1-247-847-00	CARBON	4.7K	5%	1/6W	
R210	1-247-855-00	CARBON	10K	5%	1/6W	
R211	1-247-841-00	CARBON	2.7K	5%	1/6W	
R212	1-247-831-00	CARBON	1K	5%	1/6W	
R213	1-247-871-00	CARBON	47K	5%	1/6W	
R214	1-247-863-00	CARBON	22K	5%	1/6W	
R215	1-247-831-00	CARBON	1K	5%	1/6W	
R216	1-247-841-00	CARBON	2.7K	5%	1/6W	
R217	1-247-855-00	CARBON	10K	5%	1/6W	
R218	1-247-871-00	CARBON	47K	5%	1/6W	
R219	1-247-855-00	CARBON	10K	5%	1/6W	
R220	1-247-855-00	CARBON	10K	5%	1/6W	
R221	1-247-825-00	CARBON	560	5%	1/6W	
R251	1-247-863-00	CARBON	22K	5%	1/6W	
R252	1-247-859-00	CARBON	15K	5%	1/6W	
R253	1-247-871-00	CARBON	47K	5%	1/6W	
R254	1-247-855-00	CARBON	10K	5%	1/6W	
R255	1-247-871-00	CARBON	47K	5%	1/6W	
R256	1-247-875-00	CARBON	68K	5%	1/6W	
R257	1-247-847-00	CARBON	4.7K	5%	1/6W	
R258	1-247-839-00	CARBON	2.2K	5%	1/6W	
R259	1-247-847-00	CARBON	4.7K	5%	1/6W	
R260	1-247-855-00	CARBON	10K	5%	1/6W	
R301	1-247-855-00	CARBON	10K	5%	1/6W	
R302	1-247-855-00	CARBON	10K	5%	1/6W	
R303	1-247-879-00	CARBON	100K	5%	1/6W	
R304	1-247-855-00	CARBON	10K	5%	1/6W	
R305	1-247-879-00	CARBON	100K	5%	1/6W	
R306	1-247-855-00	CARBON	10K	5%	1/6W	
R307	1-247-879-00	CARBON	100K	5%	1/6W	
R308	1-247-855-00	CARBON	10K	5%	1/6W	
R309	1-247-879-00	CARBON	100K	5%	1/6W	
R310	1-247-855-00	CARBON	10K	5%	1/6W	
R311	1-247-879-00	CARBON	100K	5%	1/6W	
R312	1-247-115-00	CARBON	220	5%	1/4W	
R313	1-247-115-00	CARBON	220	5%	1/4W	
R314	1-247-115-00	CARBON	220	5%	1/4W	
R315	1-247-115-00	CARBON	220	5%	1/4W	
R316	1-247-115-00	CARBON	220	5%	1/4W	
R317	1-247-115-00	CARBON	220	5%	1/4W	
R420	1-247-192-00	(G-AEP)...CARBON	10	5%	1/2W	
R470	1-247-192-00	(G-AEP)...CARBON	10	5%	1/2W	
R501	1-247-127-00	CARBON	680	5%	1/4W	
R551	1-247-127-00	CARBON	680	5%	1/4W	
R601	1-247-879-00	CARBON	100K	5%	1/6W	
R602	1-247-839-00	CARBON	2.2K	5%	1/6W	
R603	1-247-833-00	CARBON	1.2K	5%	1/6W	
R604	1-247-879-00	CARBON	100K	5%	1/6W	
R605	1-247-139-00	CARBON	2.2K	5%	1/4W	
R606	1-247-139-00	CARBON	2.2K	5%	1/4W	
R607	**⚠.1-217-151-00**	**METAL PLATE**	**0.22**	**10%**	**2W**	
R608	1-247-825-00	CARBON	560	5%	1/6W	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R609	1-247-825-00	CARBON	560	5%	1/6W	
R611	**⚠.1-247-192-00**	**CARBON**	**10**	**5%**	**1/2W**	**F**
R631	**⚠.1-217-399-00**	**FUSIBLE**	**100**	**5%**	**1/4W**	**F**
R632	**⚠.1-247-240-00**	**CARBON**	**1K**	**5%**	**1/2W**	**F**
R633	**⚠.1-247-240-00**	**CARBON**	**1K**	**5%**	**1/2W**	**F**
R634	**⚠.1-212-883-00**	**FUSIBLE**	**120**	**5%**	**1/4W**	**F**
R635	**⚠.1-217-399-00**	**FUSIBLE**	**100**	**5%**	**1/4W**	**F**
R651	1-247-879-00	CARBON	100K	5%	1/6W	
R652	1-247-839-00	CARBON	2.2K	5%	1/6W	
R653	1-247-833-00	CARBON	1.2K	5%	1/6W	
R654	1-247-879-00	CARBON	100K	5%	1/6W	
R655	1-247-139-00	CARBON	2.2K	5%	1/4W	
R656	1-247-139-00	CARBON	2.2K	5%	1/4W	
R657	⚠.1-217-151-00	METAL PLATE	0.22	10%	2W	
R658	1-247-825-00	CARBON	560	5%	1/6W	
R659	1-247-825-00	CARBON	560	5%	1/6W	
R661	⚠.1-247-192-00	CARBON	10	5%	1/2W	F
R671	1-247-863-00	CARBON	22K	5%	1/6W	
R672	1-247-855-00	CARBON	10K	5%	1/6W	
R673	1-247-863-00	CARBON	22K	5%	1/6W	
R674	1-247-863-00	CARBON	22K	5%	1/6W	
R675	1-247-881-00	CARBON	120K	5%	1/6W	
R676	1-247-881-00	CARBON	120K	5%	1/6W	
R677	1-247-879-00	CARBON	100K	5%	1/6W	
R678	⚠.1-247-220-00	CARBON	150	5%	1/2W	F
R679	1-247-855-00	CARBON	10K	5%	1/6W	
R680	1-247-873-00	CARBON	56K	5%	1/6W	
R903	⚠.1-217-422-00	(TA-118:AEP,E)..FUSIBLE	1	5%	1/2W	F
R904	1-247-849-00	CARBON	5.6K	5%	1/6W	
R905	⚠.1-217-422-00	FUSIBLE	1	5%	1/2W	F
R906	⚠.1-213-068-00	FUSIBLE	22	5%	1W	F
R910	⚠.1-213-135-11	METAL OXIDE	220	5%	1W	F
R911	1-247-847-00	CARBON	4.7K	5%	1/6W	
R912	1-247-855-00	CARBON	10K	5%	1/6W	
R915	⚠.I-213-135-11	METAL OXIDE	220	5%	1W	F
R916	1-247-847-00	CARBON	4.7K	5%	1/6W	
R917	1-247-855-00	CARBON	10K	5%	1/6W	
R920	⚠.1-247-180-00	(TA-118W:US,Canadian)...CARBON	1	5%	1/2W	F
R921	⚠.1-247-180-00	(TA-118W:US,Canadian)...CARBON	1	5%	1/2W	F
R931	⚠.1-202-723-00	(TA-118W:US,Canadian)...SOLID	2.2M	10%	1/2W	
RV201	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 100Hz)				
RV202	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 400Hz)				
RV203	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 1kHz)				
RV204	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 4kHz)				
RV205	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 12kHz)				
RV206	1-230-360-11	RES, VAR, SLIDE 100K (BALANCE)				
RV207	1-230-361-11	RES, VAR, SLIDE 50K (MIC LEVEL)				
RV208	1-230-793-11	RES, VAR, SLIDE 50K/50K (VOLUME)				
RY601	1-515-503-00	RELAY				
S1	⚠.1-553-318-51	SWITCH, PUSH (AC POWER)(1 KEY)				
S2	⚠.1-526-576-51	(TA-118W:US,Canadian)(TA-118:E)... SELECTOR, POWER VOLTAGE				
S3	1-570-205-11	SWITCH, PUSH (4 KEY)(FUNCTION)				
T1	⚠.1-448-133-11	(TA-118:E).........TRANSFORMER, POWER				
T1	⚠.1-448-134-11	(TA-118:AEP).......TRANSFORMER, POWER				
T1	⚠.1-448-257-11	(TA-118W:US,Canadian) ...TRANSFORMER, POWER				

INTEGRATED STEREO AMPLIFIER
〔TA-158〕

Note: TA-158 is an integrated stereo amplifier unit in FH-15R.

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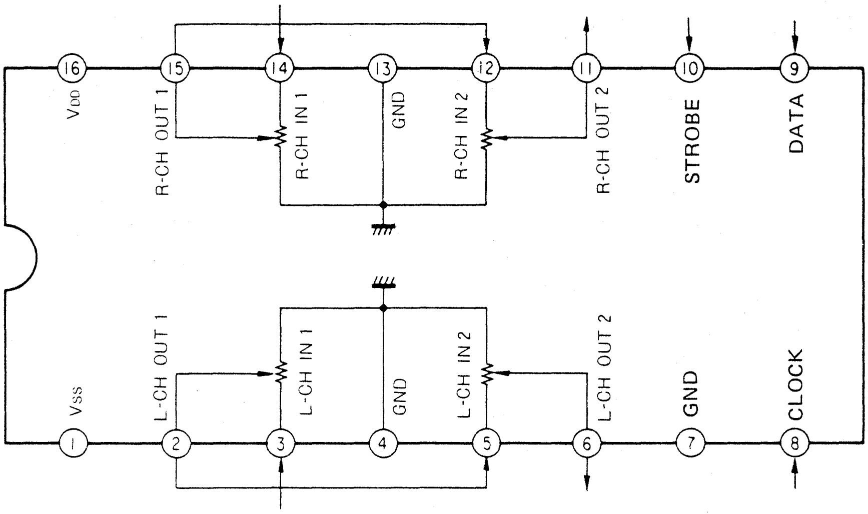
1. IC'S OPERATION

1-1. TC9176P (IC203)

TC9176P is an IC served as electronic volume.
This IC is capable of controlling the attenuation from 0 dB to −76 dB at intervals of 2 dB.


16
15
14
13
12
11
10
9
VDD
R-CH OUT 1
R-CH IN 1
GND
R-CH IN 2
R-CH OUT 2
STROBE
DATA
VSS
L-CH OUT 1
L-CH IN 1
GND
L-CH IN 2
L-CH OUT 2
GND
CLOCK
1
2
3
4
5
6
7
8

- **Pin Functions**

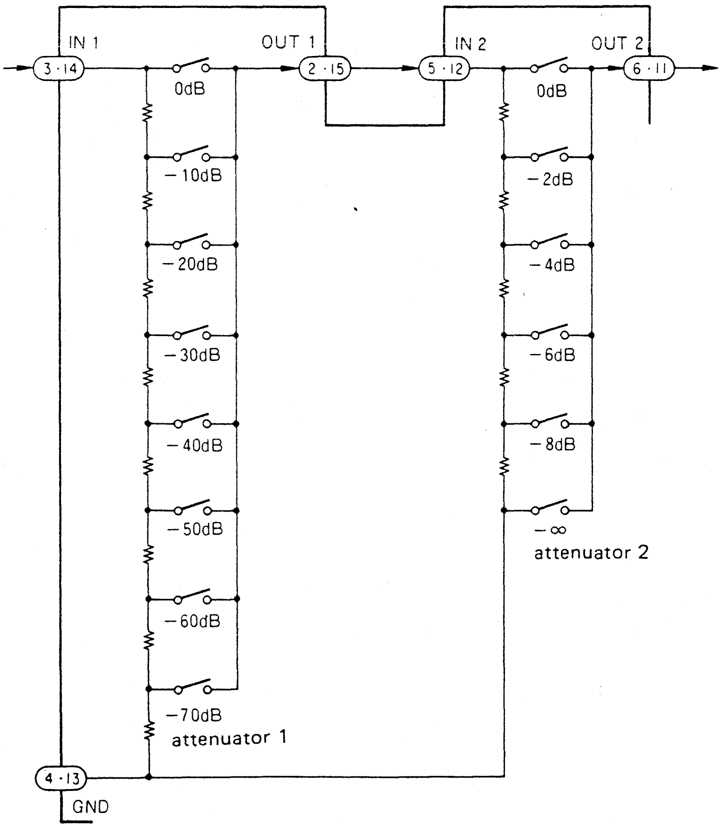
② L-CH OUT 1, ⑮ R-CH OUT 1
Output pin for 10 dB step attenuator.
The signal applied to L/R-CH IN 1 attenuates 8 steps from 0 to −70 dB at intervals of 10 dB.

③ L-CH IN 1, ⑭ R-CH IN 1
Input pin for 10 dB step attenuator.

⑥ L-CH OUT 2, ⑪ R-CH OUT 2
Output pin for 2 dB step attenuator.
The signal applied to L/R-CH IN 2 attenuates 5 steps from 0 to −8 dB at intervals of 2 dB.

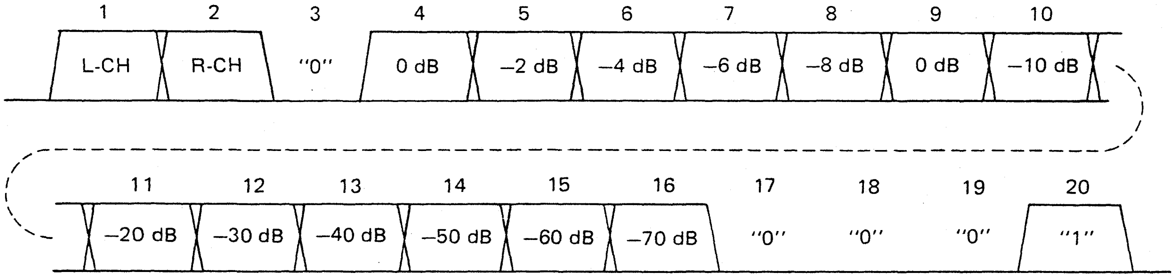
⑤ L-CH IN 2, ⑫ R-CH IN 2
Input pin for 2 dB step attenuator.

The attenuator is composed of the resistors and the analog switches.
Attenuator 1 attenuates 10 dB steps from 0 to −70 dB and attenuator 2 attenuates 2 dB steps from 0 to 8 dB.
Total attenuation is 2 dB steps from 0 to −76 dB.


IN 1
OUT 1
IN 2
OUT 2
3·14
2·15
5·12
6·11
0dB
−10dB
−20dB
−30dB
−40dB
−50dB
−60dB
−70dB
attenuator 1
0dB
−2dB
−4dB
−6dB
−8dB
−∞
attenuator 2
4·13
GND

⑨ DATA

This pin is input the serial data from IC301.
Data contain attenuation value and selection of L-CH or R-CH, and these are composed of 20 bits.

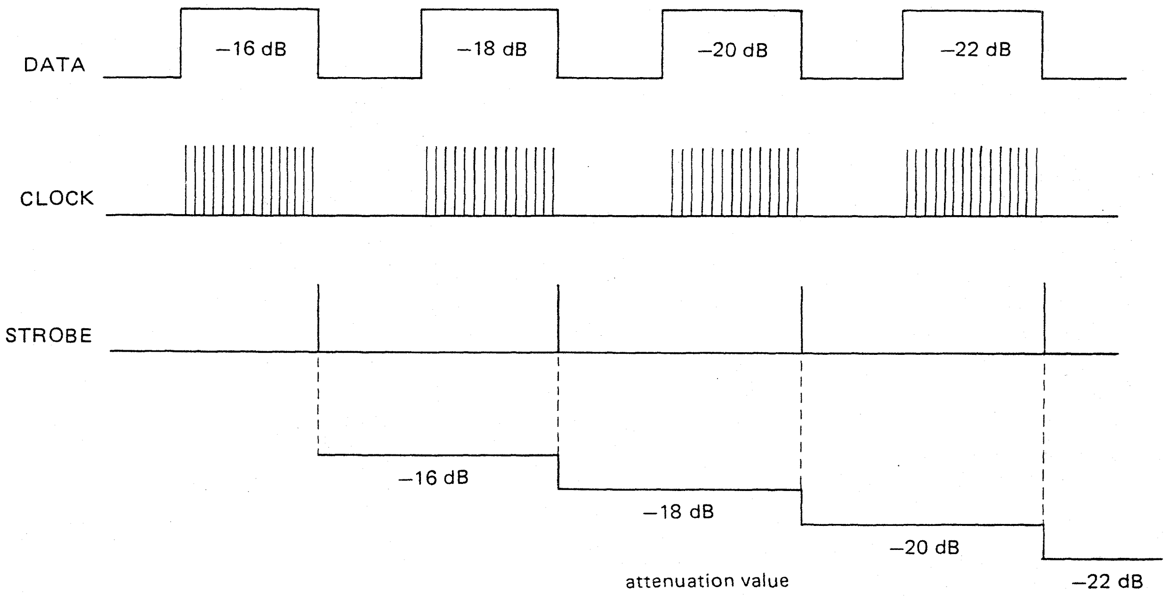

1
2
3
4
5
6
7
8
9
10
L-CH
R-CH
"0"
0 dB
−2 dB
−4 dB
−6 dB
−8 dB
0 dB
−10 dB
11
12
13
14
15
16
17
18
19
20
−20 dB
−30 dB
−40 dB
−50 dB
−60 dB
−70 dB
"0"
"0"
"0"
"1"

⑧ CLOCK

This pin is input the clock signal.
Data are input to the pin ⑨ that is synchronized by clock signal.

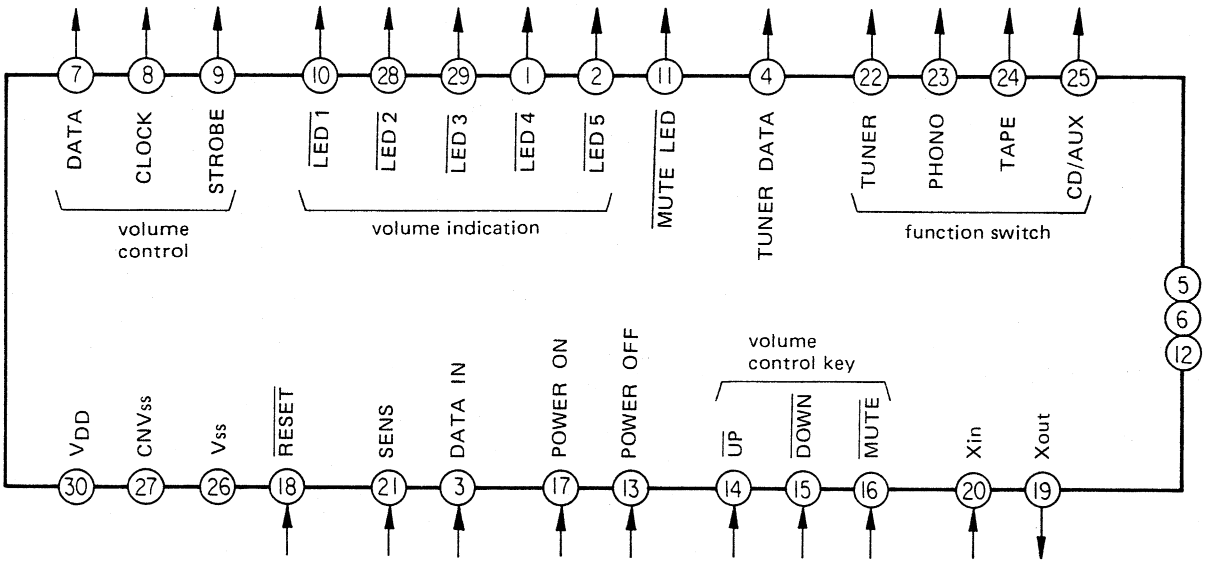
⑩ STROBE

This pin is input the strobe pulse.
Data are latched, when strobe pulse is input to pin ⑩.

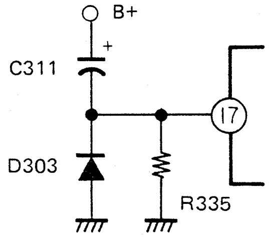
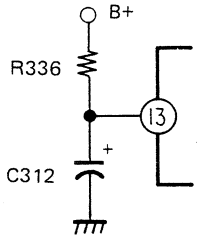

DATA
−16 dB
−18 dB
−20 dB
−22 dB
CLOCK
STROBE
−16 dB
−18 dB
−20 dB
attenuation value
−22 dB

1-2. M50765-440SP (IC301)

M50765-440SP decodes the serial data of remote controller and feeds the volume control data to IC203.


7 DATA
8 CLOCK
9 STROBE
volume control
10 LED1
28 LED2
29 LED3
1 LED4
2 LED5
volume indication
11 MUTE LED
4 TUNER DATA
22 TUNER
23 PHONO
24 TAPE
25 CD/AUX
function switch
5
6
12
30 VDD
27 CNVss
26 Vss
18 RESET
21 SENS
3 DATA IN
17 POWER ON
13 POWER OFF
volume control key
14 UP
15 DOWN
16 MUTE
20 Xin
19 Xout

- **Pin Functions**

Pin Number	Pin Name	I/O	Function
3	DATA IN	Input	This pin is input the serial data of remote controller.
21	SENS	Input	Input pin for starting transmission of the remote controller data. Input data ③ DATA is read at the beginning of the signal input to this pin.
17 13	POWER ON POWER OFF	Input Input	When power is turned on, pin ⑰ is input high level pulse from differential circuit and IC will be in standby mode. Second, pin ⑬ goes high level by integrating circuit and IC will be started.  B+ C311 D303 R335 17  B+ R336 C312 13 After power is turned off, ⑬ pin goes low level by integrating circuit and IC detects power off. IC's data (volume data) are kept by back-up battery.
14 15	UP DOWN	Input Input	Input pin for volume control. When the signal is applied to these pins, ⑦ DATA, ⑧ CLOCK and ⑨ STROBE output the volume control data to IC203.
16	MUTE	Input	Input pin for switching MUTING –20 dB on/off.
22	TUNER	Output	Output pin for switching the mode to TUNER. When ③ DATA IN inputs the data of TUNER, this pin goes high.

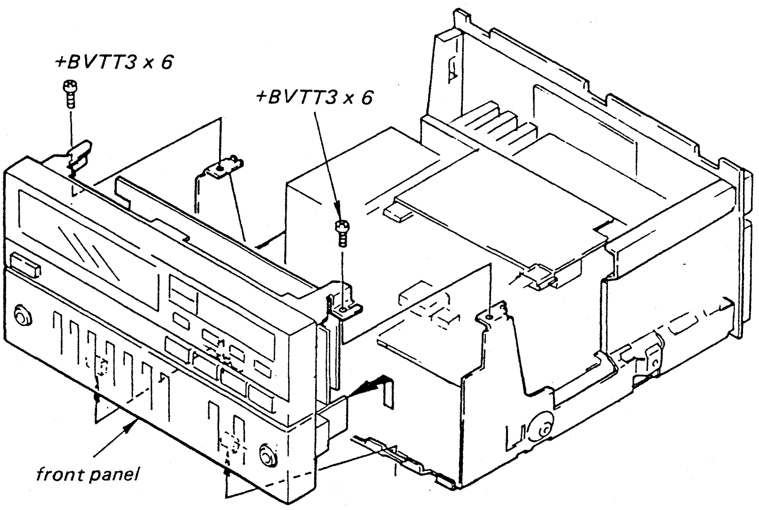
<table>
<tr><th>Pin Number</th><th>Pin Name</th><th>I/O</th><th>Function</th></tr>
<tr><td>23</td><td>PHONO</td><td>Output</td><td>Output pin for switching the mode to PHONO.
When ③ DATA IN inputs the data of PHONO, this pin goes high.</td></tr>
<tr><td>24</td><td>TAPE</td><td>Output</td><td>Output pin for switching the mode to TAPE.
When ③ DATA IN inputs the data of TAPE, this goes high.</td></tr>
<tr><td>25</td><td>CD/AUX</td><td>Output</td><td>Output pin for switching the mode to CD/AUX.
When ③ DATA IN inputs the data of CD/AUX, this pin goes high.</td></tr>
<tr><td>11</td><td>$\overline{\text{MUTE LED}}$</td><td>Output</td><td>Output pin for switching the MUTING –20 dB LED on/off.</td></tr>
<tr><td>10
28
29
1
2</td><td>$\overline{\text{LED 1}}$
$\overline{\text{LED 2}}$
$\overline{\text{LED 3}}$
$\overline{\text{LED 4}}$
$\overline{\text{LED 5}}$</td><td>Output</td><td>Output pin for indicating the volume level.
These pins output signal that cope with volume level.
<table>
<tr><th rowspan="2">Volume level (dB)</th><th colspan="5">Pin</th></tr>
<tr><th>⑩</th><th>㉘</th><th>㉙</th><th>①</th><th>②</th></tr>
<tr><td>0 to –2</td><td>L</td><td>L</td><td>L</td><td>L</td><td>L</td></tr>
<tr><td>–4 to –6</td><td>L</td><td>L</td><td>L</td><td>L</td><td>H</td></tr>
<tr><td>–8 to –18</td><td>L</td><td>L</td><td>L</td><td>H</td><td>H</td></tr>
<tr><td>–20 to –34</td><td>L</td><td>L</td><td>H</td><td>H</td><td>H</td></tr>
<tr><td>–36 to –76</td><td>L</td><td>H</td><td>H</td><td>H</td><td>H</td></tr>
<tr><td>–78 to –∞</td><td>H</td><td>H</td><td>H</td><td>H</td><td>H</td></tr>
</table>
H: high level
L: low level</td></tr>
<tr><td>4</td><td>TUNER DATA</td><td>Output</td><td>This pin outputs the receiving band/station switching signal. That signal feeds to tuner unit (ST-158).</td></tr>
<tr><td>7</td><td>DATA</td><td>Output</td><td>This pin outputs the volume control data to IC203.</td></tr>
<tr><td>8</td><td>CLOCK</td><td>Output</td><td>This pin outputs the clock signal of volume control data.</td></tr>
<tr><td>9</td><td>STROBE</td><td>Output</td><td>This pin outputs the strobe signal of volume control data.</td></tr>
</table>

2. DISASSEMBLY

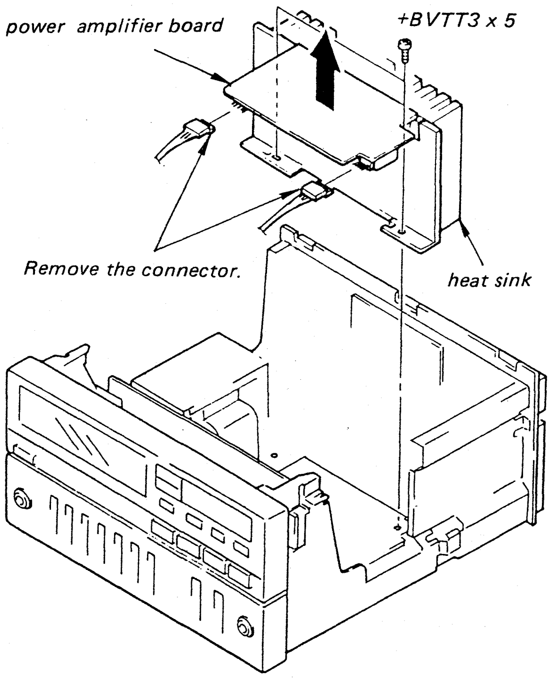
Note: Follow the disassembly procedure in the numerical order given.

- Remove the case.
(four screws)

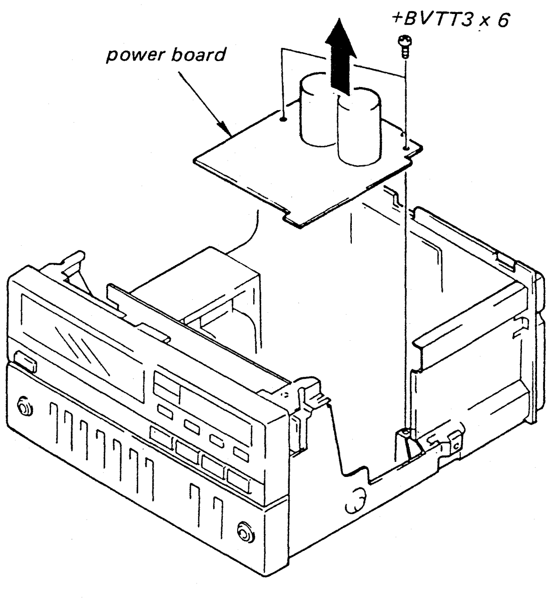
FRONT PANEL


+BVTT3 x 6
+BVTT3 x 6
front panel

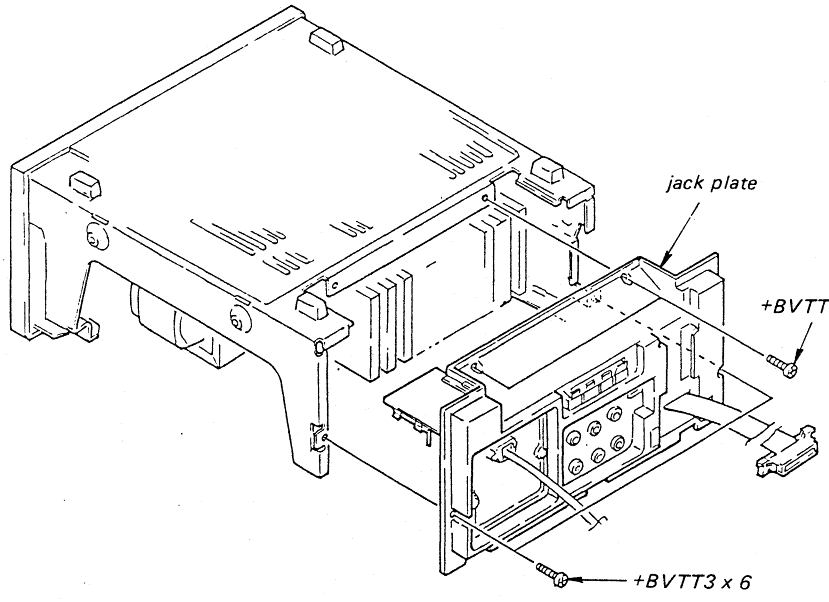
POWER AMPLIFIER BOARD


power amplifier board
+BVTT3 x 5
Remove the connector.
heat sink

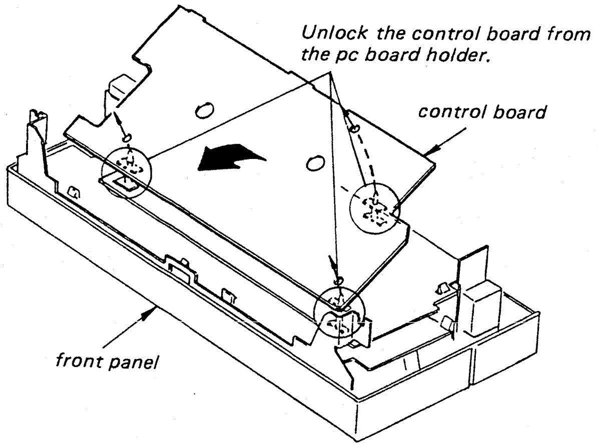
POWER BOARD


+BVTT3 x 6
power board

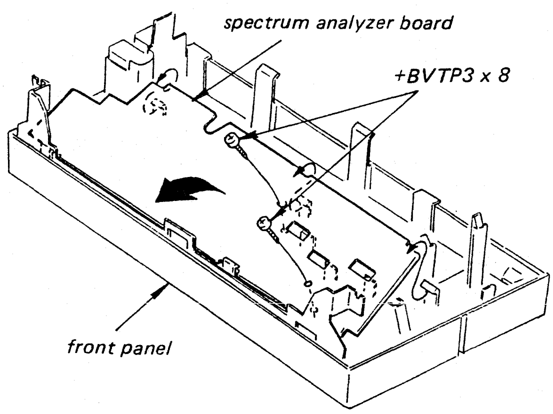
JACK PLATE


jack plate
+BVTT3 x 6
+BVTT3 x 6

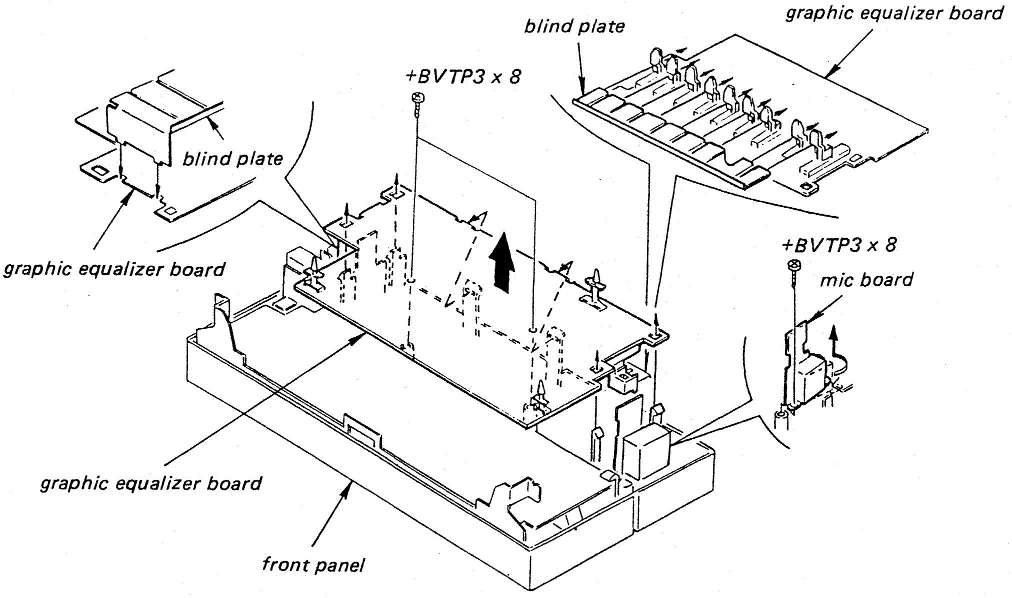
CONTROL BOARD


Unlock the control board from the pc board holder.
control board
front panel

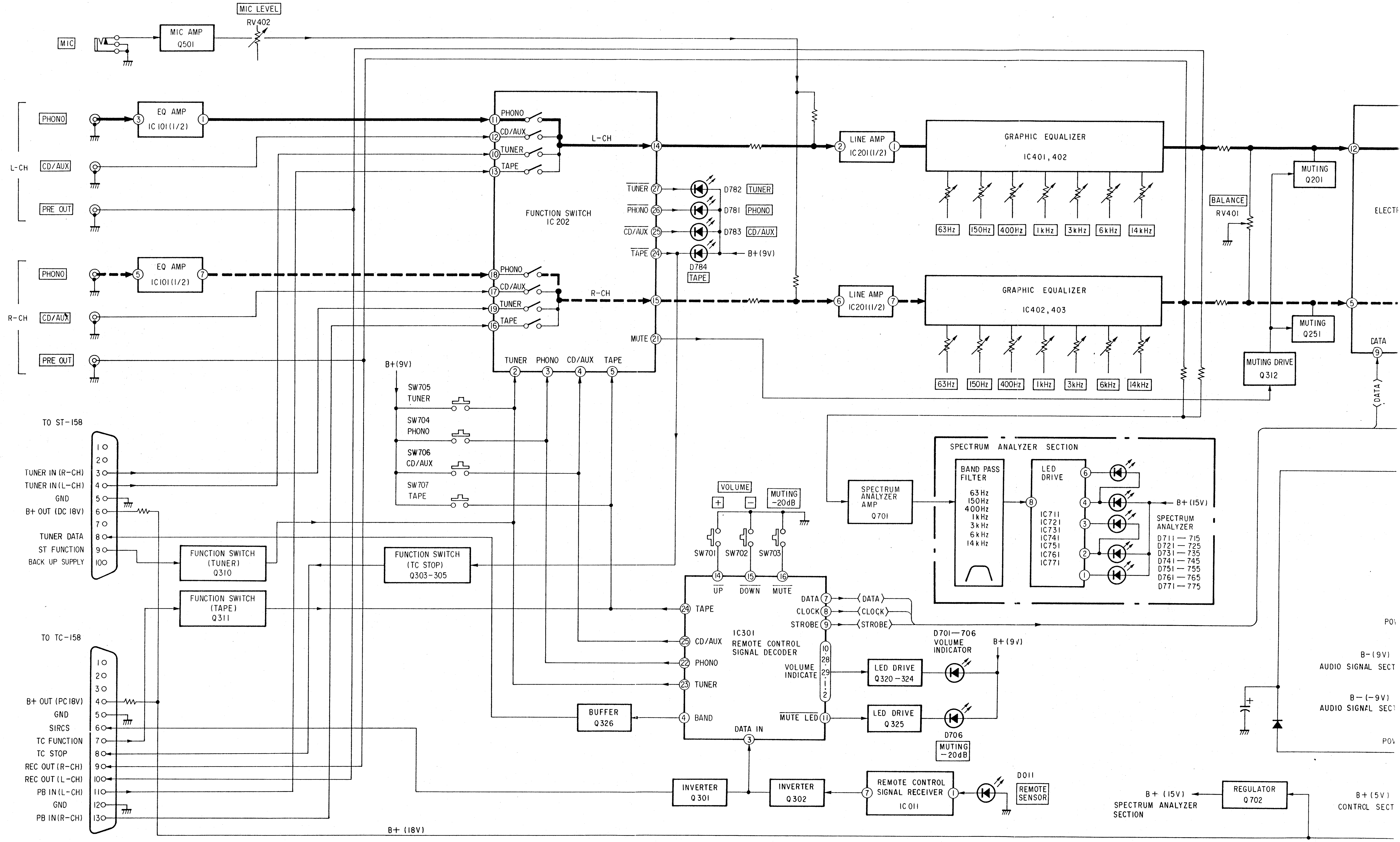
SPECTRUM ANALYZER BOARD

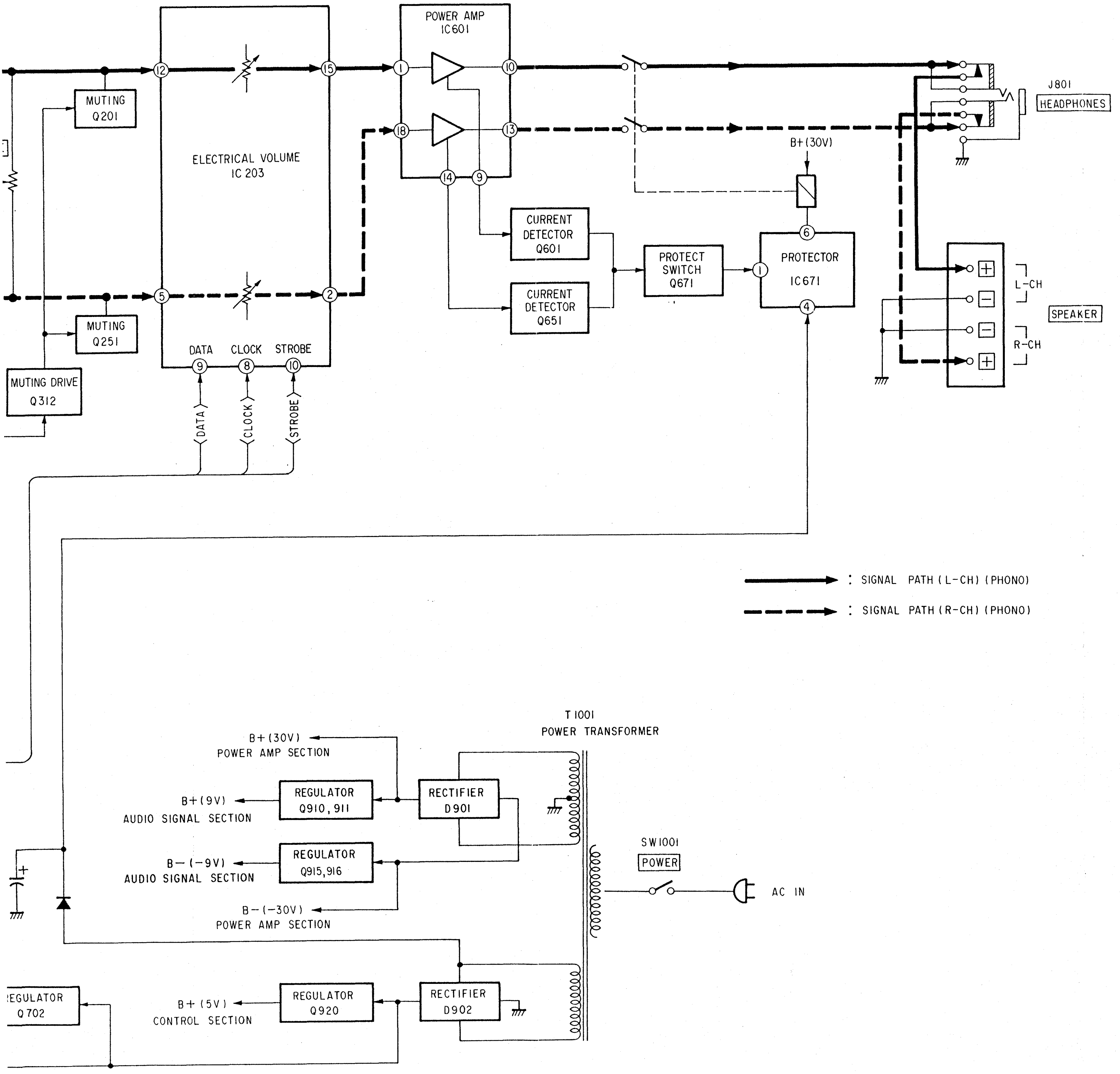

spectrum analyzer board
+BVTP3 x 8
front panel

GRAPHIC EQUALIZER BOARD

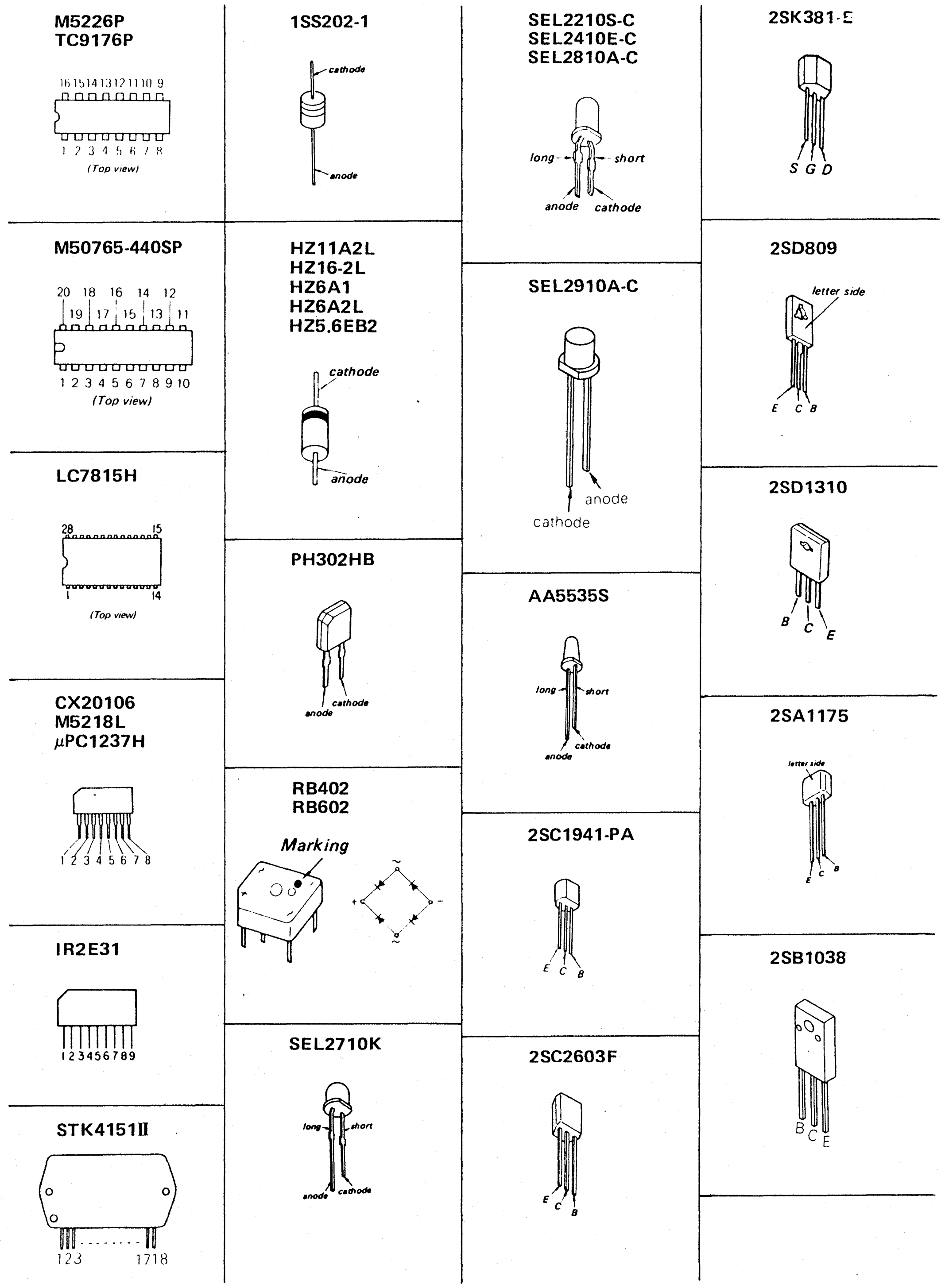

blind plate
graphic equalizer board
+BVTP3 x 8
blind plate
graphic equalizer board
+BVTP3 x 8
mic board
graphic equalizer board
front panel

3. BLOCK DIAGRAM


MIC LEVEL
RV402
MIC
MIC AMP
Q501
L-CH
PHONO
EQ AMP
IC101(1/2)
CD/AUX
PRE OUT
R-CH
PHONO
EQ AMP
IC101(1/2)
CD/AUX
PRE OUT
PHONO
CD/AUX
TUNER
TAPE
L-CH
FUNCTION SWITCH
IC 202
TUNER
PHONO
CD/AUX
TAPE
D782 TUNER
D781 PHONO
D783 CD/AUX
D784 TAPE
B+(9V)
PHONO
CD/AUX
TUNER
TAPE
R-CH
MUTE
TUNER
PHONO
CD/AUX
TAPE
LINE AMP
IC201(1/2)
GRAPHIC EQUALIZER
IC401, 402
63Hz
150Hz
400Hz
1kHz
3kHz
6kHz
14kHz
LINE AMP
IC201(1/2)
GRAPHIC EQUALIZER
IC402, 403
63Hz
150Hz
400Hz
1kHz
3kHz
6kHz
14kHz
BALANCE
RV401
MUTING
Q201
MUTING
Q251
MUTING DRIVE
Q312
ELECT
DATA
(DATA)
B+(9V)
SW705
TUNER
SW704
PHONO
SW706
CD/AUX
SW707
TAPE
TO ST-158
1
2
TUNER IN (R-CH) 3
TUNER IN (L-CH) 4
GND 5
B+ OUT (DC 18V) 6
7
TUNER DATA 8
ST FUNCTION 9
BACK UP SUPPLY 10
FUNCTION SWITCH
(TUNER)
Q310
FUNCTION SWITCH
(TC STOP)
Q303-305
FUNCTION SWITCH
(TAPE)
Q311
TO TC-158
1
2
3
B+ OUT (PC18V) 4
GND 5
SIRCS 6
TC FUNCTION 7
TC STOP 8
REC OUT (R-CH) 9
REC OUT (L-CH) 10
PB IN (L-CH) 11
GND 12
PB IN (R-CH) 13
VOLUME
+
−
MUTING
−20dB
SW701
SW702
SW703
UP
DOWN
MUTE
TAPE
CD/AUX
PHONO
TUNER
BAND
IC301
REMOTE CONTROL
SIGNAL DECODER
DATA
CLOCK
STROBE
(DATA)
(CLOCK)
(STROBE)
VOLUME
INDICATE
MUTE LED
DATA IN
BUFFER
Q326
D701—706
VOLUME
INDICATOR
B+(9V)
LED DRIVE
Q320-324
LED DRIVE
Q325
D706
MUTING
−20dB
INVERTER
Q301
INVERTER
Q302
REMOTE CONTROL
SIGNAL RECEIVER
IC011
D011
REMOTE
SENSOR
B+ (18V)
SPECTRUM ANALYZER SECTION
SPECTRUM
ANALYZER
AMP
Q701
BAND PASS
FILTER
63Hz
150Hz
400Hz
1kHz
3kHz
6kHz
14kHz
LED
DRIVE
IC711
IC721
IC731
IC741
IC751
IC761
IC771
B+ (15V)
SPECTRUM
ANALYZER
D711 — 715
D721 — 725
D731 — 735
D741 — 745
D751 — 755
D761 — 765
D771 — 775
PO
B-(9V)
AUDIO SIGNAL SECT
B-(-9V)
AUDIO SIGNAL SEC
PO
B+ (15V)
SPECTRUM ANALYZER
SECTION
REGULATOR
Q702
B+ (5V)
CONTROL SECT


POWER AMP
IC601
MUTING
Q201
ELECTRICAL VOLUME
IC 203
J801
HEADPHONES
B+(30V)
CURRENT
DETECTOR
Q601
PROTECT
SWITCH
Q671
PROTECTOR
IC671
CURRENT
DETECTOR
Q651
L-CH
SPEAKER
R-CH
MUTING
Q251
MUTING DRIVE
Q312
DATA
CLOCK
STROBE
DATA
CLOCK
STROBE
: SIGNAL PATH (L-CH) (PHONO)
: SIGNAL PATH (R-CH) (PHONO)
T1001
POWER TRANSFORMER
B+(30V)
POWER AMP SECTION
REGULATOR
Q910, 911
RECTIFIER
D901
B+(9V)
AUDIO SIGNAL SECTION
REGULATOR
Q915, 916
B-(-9V)
AUDIO SIGNAL SECTION
SW1001
POWER
AC IN
B-(-30V)
POWER AMP SECTION
EGULATOR
Q702
B+(5V)
CONTROL SECTION
REGULATOR
Q920
RECTIFIER
D902

- **Semiconductor Lead Layouts**


M5226P
TC9176P
16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)
M50765-440SP
20 18 16 14 12
19 17 15 13 11
1 2 3 4 5 6 7 8 9 10
(Top view)
LC7815H
28 15
1 14
(Top view)
CX20106
M5218L
μPC1237H
1 2 3 4 5 6 7 8
IR2E31
123456789
STK4151II
123 1718
1SS202-1
cathode
anode
HZ11A2L
HZ16-2L
HZ6A1
HZ6A2L
HZ5.6EB2
cathode
anode
PH302HB
cathode
anode
RB402
RB602
Marking
SEL2710K
long
short
anode
cathode
SEL2210S-C
SEL2410E-C
SEL2810A-C
long
short
anode
cathode
SEL2910A-C
anode
cathode
AA5535S
long
short
cathode
anode
2SC1941-PA
E C B
2SC2603F
E C B
2SK381-E
S G D
2SD809
letter side
E C B
2SD1310
B C E
2SA1175
letter side
E C B
2SB1038
B C E

4. MOUNTING DIAGRAM

- See page TA158-7 for Semiconductor Lead Layouts.

Note on Mounting Diagram:

- ○—— : parts extracted from the component side.
- ●—— : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- ——→—— : signal path
- ——·——→ : L-CH signal path
- ——··——→ : R-CH signal path
- ▨ : B + pattern
- ■ : B – pattern

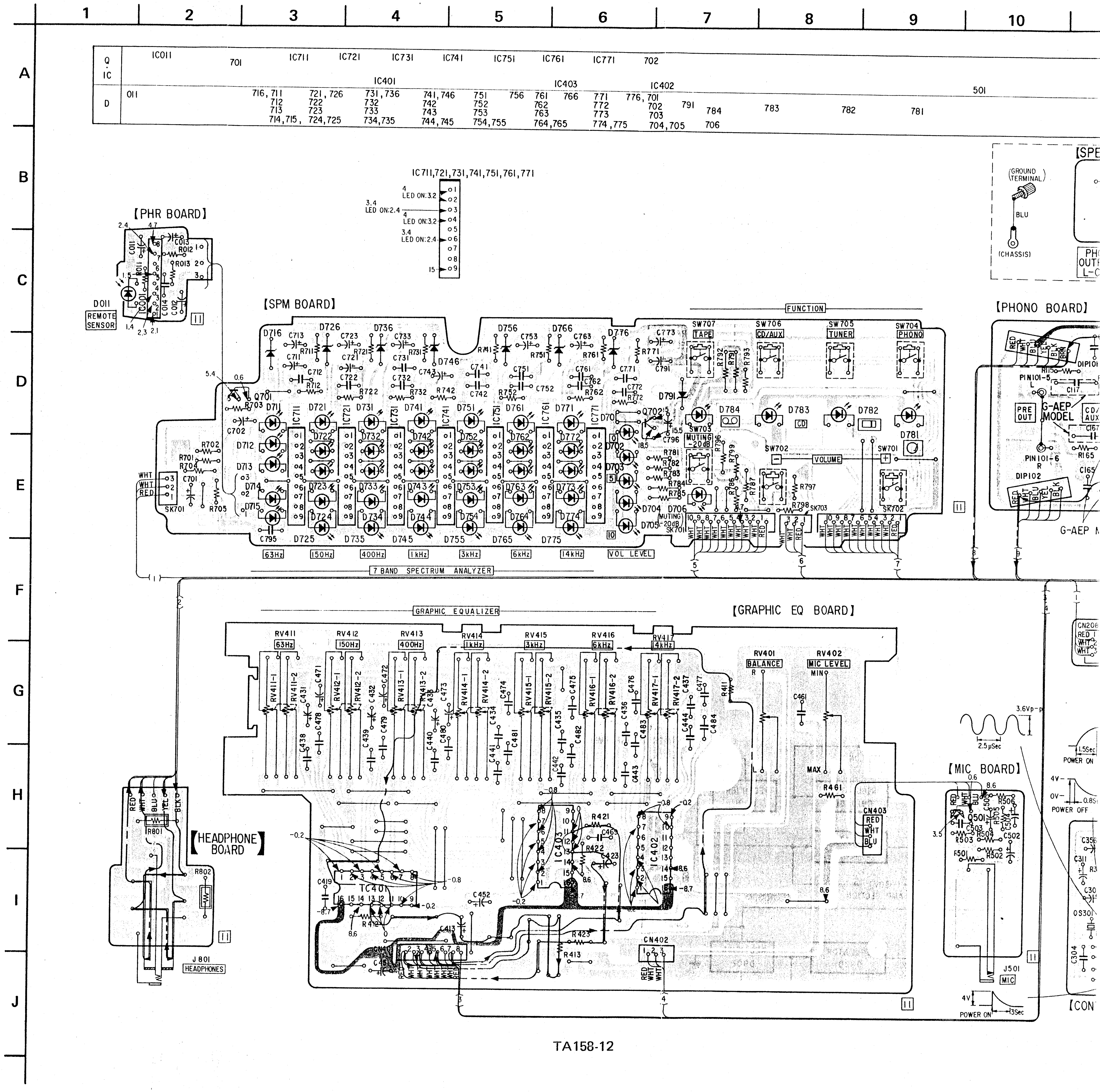
Note on Schematic Diagram:

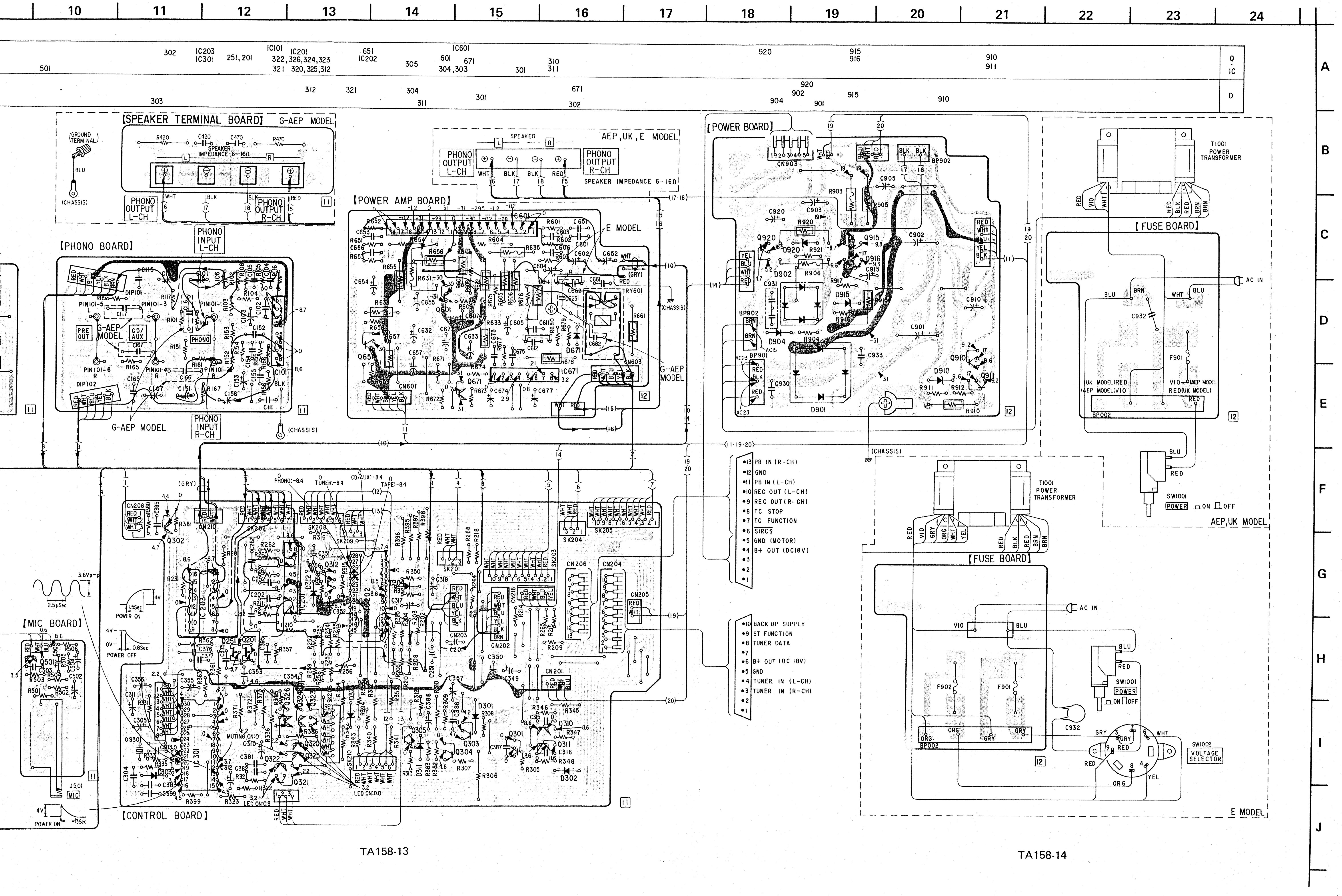
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- ⇨ : signal path.
- Components for right channel have same values as for left channel. Reference numbers are coded from 150, 250, 450, 650.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- Switch

Ref. No.	Switch	Position
SW701	VOLUME UP	OFF
SW702	VOLUME DOWN	OFF
SW703	MUTING –20 dB	OFF
SW704	PHONO	OFF
SW705	TUNER	OFF
SW706	CD/AUX	OFF
SW707	TAPE	OFF
SW1001	POWER	OFF
SW1002	VOLTAGE SELECTOR	–

- ☐ : adjustment for repair.
- ━━━ : B+ bus.
- ━ ━ ━ : B– bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.

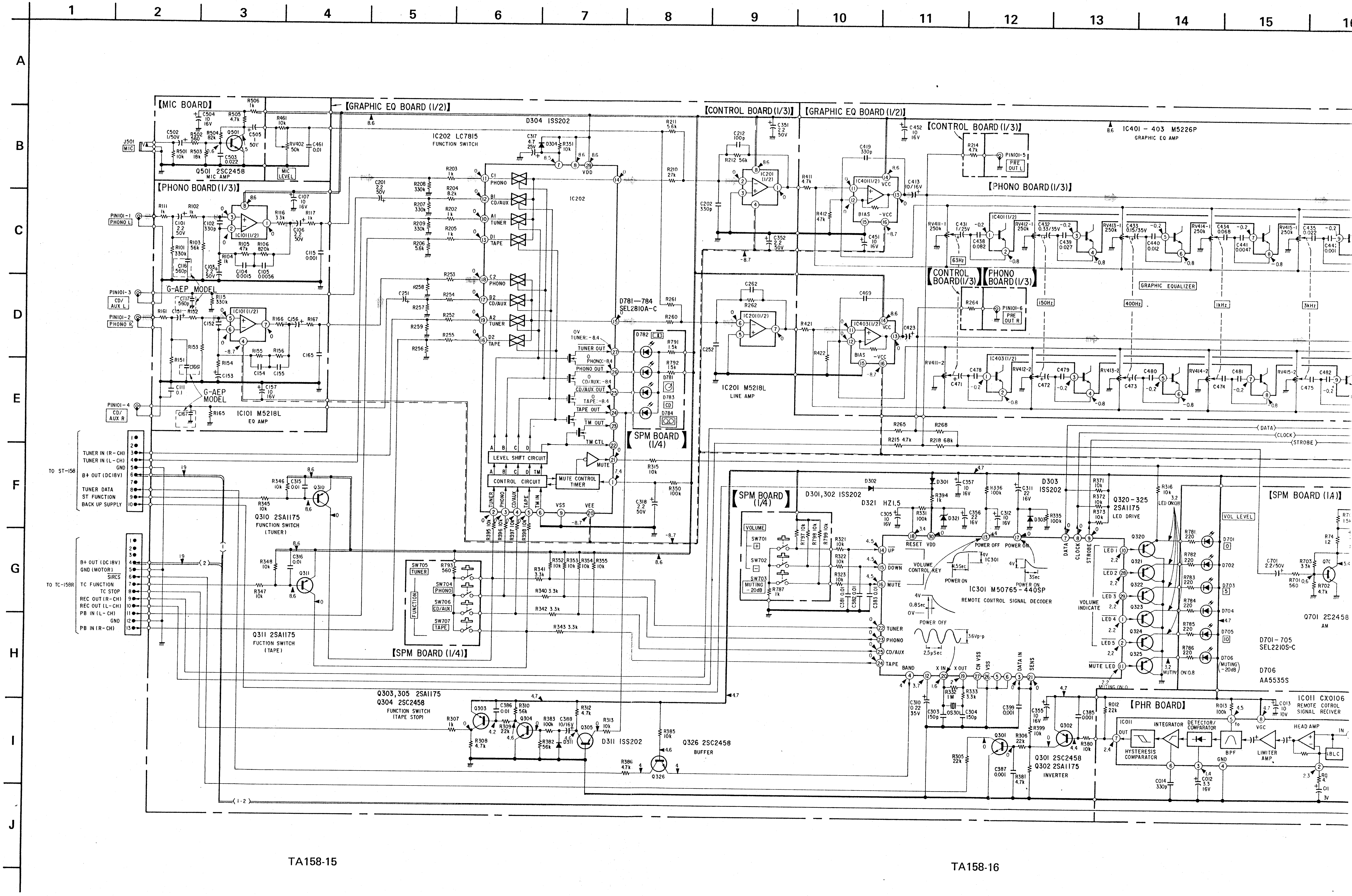
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

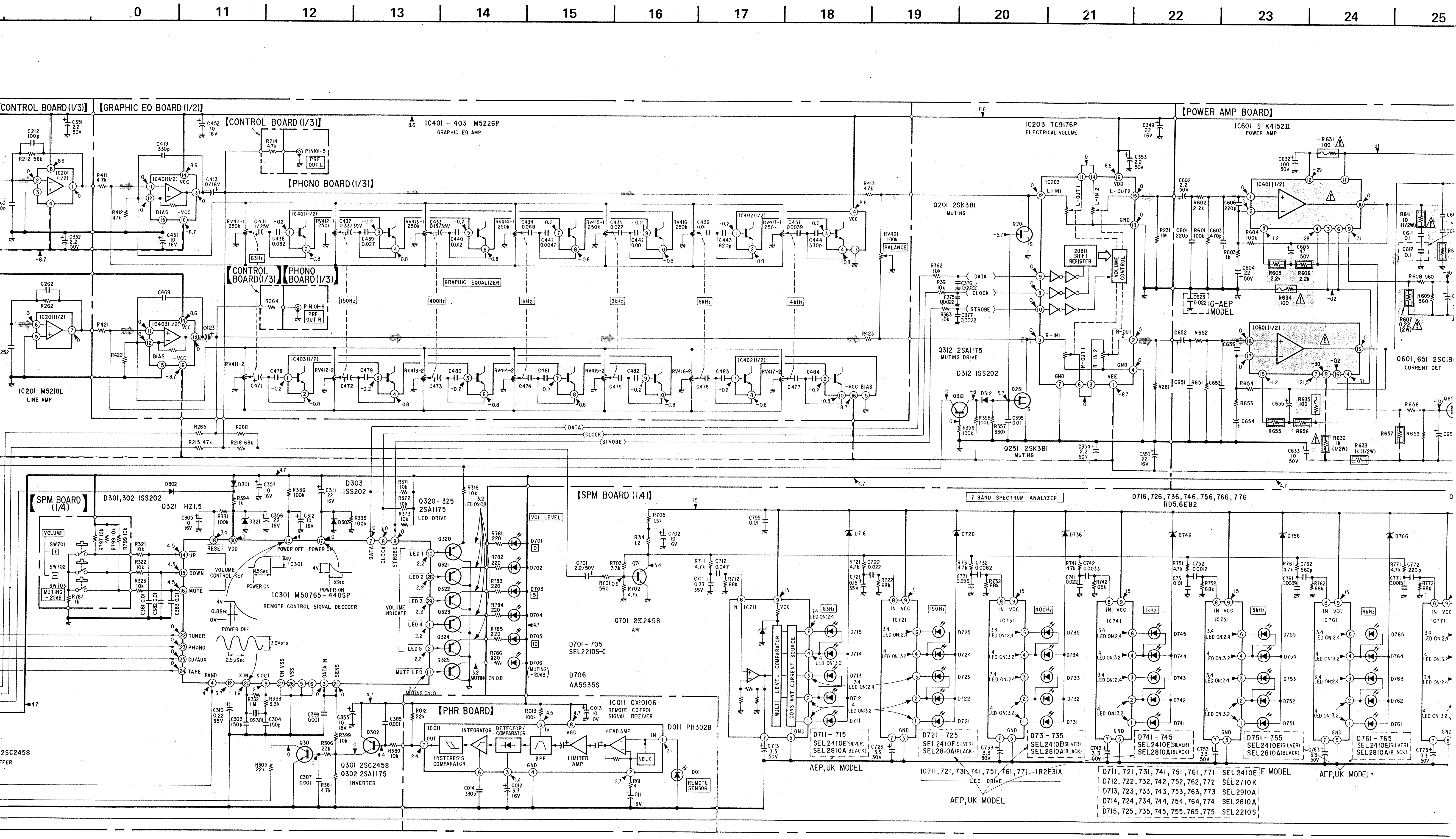

1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
G
H
I
J
Q·IC
D
IC011
IC711
IC721
IC731
IC741
IC751
IC761
IC771
IC401
IC403
IC402
IC711,721,731,741,751,761,771
[PHR BOARD]
D011 REMOTE SENSOR
[SPM BOARD]
FUNCTION
SW707 TAPE
SW706 CD/AUX
SW705 TUNER
SW704 PHONO
SW703 MUTING -20dB
SW702 VOLUME
SW701
63Hz
150Hz
400Hz
1kHz
3kHz
6kHz
14kHz
VOL LEVEL
7 BAND SPECTRUM ANALYZER
GRAPHIC EQUALIZER
[GRAPHIC EQ BOARD]
RV411 63Hz
RV412 150Hz
RV413 400Hz
RV414 1kHz
RV415 3kHz
RV416 6kHz
RV417 14kHz
RV401 BALANCE
RV402 MIC LEVEL
[HEADPHONE BOARD]
J801 HEADPHONES
CN402
CN403
[MIC BOARD]
J501 MIC
[PHONO BOARD]
G-AEP MODEL
PRE OUT
GROUND TERMINAL
CHASSIS
BLU
POWER ON
POWER OFF


【SPEAKER TERMINAL BOARD】 G-AEP MODEL
SPEAKER IMPEDANCE 6-16Ω
PHONO OUTPUT L-CH
PHONO OUTPUT R-CH
(GROUND TERMINAL)
(CHASSIS)
AEP,UK,E MODEL
SPEAKER
SPEAKER IMPEDANCE 6-16Ω
【PHONO BOARD】
PHONO INPUT L-CH
PHONO INPUT R-CH
G-AEP MODEL
PRE OUT
CD/AUX
【POWER AMP BOARD】
E MODEL
G-AEP MODEL
RY601
【POWER BOARD】
CN903
BP902
BP901
D901
D902
D904
【FUSE BOARD】
T1001 POWER TRANSFORMER
AC IN
F901
F902
UK MODEL:RED
(AEP MODEL)V10
V10→(AEP MODEL)
RED(UK MODEL)
BP002
SW1001 POWER ON OFF
AEP,UK MODEL
SW1002 VOLTAGE SELECTOR
E MODEL
【MIC BOARD】
J501 MIC
3.6Vp-p
2.5μSec
1.5Sec
POWER ON
0.8Sec
POWER OFF
13Sec
【CONTROL BOARD】
PHONO:-8.4
TUNER:-8.4
CD/AUX:-8.4
TAPE:-8.4
MUTING ON:0
LED ON:0.8
•13 PB IN (R-CH)
•12 GND
•11 PB IN (L-CH)
•10 REC OUT (L-CH)
•9 REC OUT (R-CH)
•8 TC STOP
•7 TC FUNCTION
•6 SIRCS
•5 GND (MOTOR)
•4 B+ OUT (DC18V)
•3
•2
•1
•10 BACK UP SUPPLY
•9 ST FUNCTION
•8 TUNER DATA
•7
•6 B+ OUT (DC 18V)
•5 GND
•4 TUNER IN (L-CH)
•3 TUNER IN (R-CH)
•2
•1

5. SCHEMATIC DIAGRAM

• See page TA158-11 for notes.


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
【MIC BOARD】
J501 MIC
Q501 2SC2458 MIC AMP
MIC LEVEL
【GRAPHIC EQ BOARD (1/2)】
【PHONO BOARD (1/3)】
PIN101-1 PHONO L
PIN101-3 CD/AUX L
PIN101-2 PHONO R
PIN101-4 CD/AUX R
IC101(1/2)
G-AEP MODEL
IC101 M5218L EQ AMP
IC202 LC7815 FUNCTION SWITCH
D304 1SS202
IC202
PHONO
CD/AUX
TUNER
TAPE
VDD
VSS
VEE
D781-784 SEL2810A-C
TUNER OUT
PHONO OUT
CD/AUX OUT
TAPE OUT
TM OUT
TM CTL
MUTE
LEVEL SHIFT CIRCUIT
CONTROL CIRCUIT
MUTE CONTROL TIMER
【SPM BOARD (1/4)】
D782
D781
D783
D784
TUNER IN (R-CH)
TUNER IN (L-CH)
GND
B+ OUT (DC18V)
TUNER DATA
ST FUNCTION
BACK UP SUPPLY
TO ST-158
B+ OUT (DC 18V)
GND (MOTOR)
SIRCS
TC FUNCTION
TC STOP
REC OUT (R-CH)
REC OUT (L-CH)
PB IN (L-CH)
GND
PB IN (R-CH)
TO TC-158R
Q310 2SA1175 FUNCTION SWITCH (TUNER)
Q311 2SA1175 FUCTION SWITCH (TAPE)
SW705 TUNER
SW704 PHONO
SW706 CD/AUX
SW707 TAPE
FUNCTION
【SPM BOARD (1/4)】
Q303,305 2SA1175
Q304 2SC2458
FUNCTION SWITCH (TAPE STOP)
D311 1SS202
Q326 2SC2458 BUFFER
【CONTROL BOARD (1/3)】
【GRAPHIC EQ BOARD (1/2)】
IC201 (1/2)
IC401 (1/2)
BIAS -VCC
VCC
【CONTROL BOARD (1/3)】
PIN101-5 PRE OUT L
IC401 - 403 M5226P GRAPHIC EQ AMP
【PHONO BOARD (1/3)】
【CONTROL BOARD (1/3)】
【PHONO BOARD (1/3)】
PIN101-6 PRE OUT R
IC201(1/2)
IC403(1/2)
IC201 M5218L LINE AMP
IC401(1/2)
IC403(1/2)
63Hz
150Hz
400Hz
1kHz
3kHz
GRAPHIC EQUALIZER
DATA
CLOCK
STROBE
【SPM BOARD (1/4)】
D301,302 1SS202
D321 HZ1.5
D302
D301
D303 1SS202
VOLUME
SW701
SW702
SW703 MUTING -20dB
RESET
VDD
POWER OFF
POWER ON
UP
DOWN
MUTE
VOLUME CONTROL KEY
IC301
POWER ON
IC301 M50765-440SP REMOTE CONTROL SIGNAL DECODER
POWER OFF
3.6Vp-p
2.5μSec
TUNER
PHONO
CD/AUX
TAPE
BAND
X IN
X OUT
CN VSS
VSS
DATA IN
SENS
DATA
CLOCK
STROBE
Q320-325 2SA1175 LED DRIVE
VOLUME INDICATE
LED 1
LED 2
LED 3
LED 4
LED 5
MUTE LED
MUTING ON:0.8
Q320
Q321
Q322
Q323
Q324
Q325
D701
D702
D703
D704
D705
D706 (MUTING -20dB)
VOL LEVEL
【SPM BOARD (1/4)】
D701-705 SEL2210S-C
D706 AA5535S
Q701 2SC2458 AM
Q301 2SC2458
Q302 2SA1175
INVERTER
【PHR BOARD】
IC011 CX0106 REMOTE COTROL SIGNAL RECIVER
IC011
OUT
INTEGRATOR
DETECTOR/COMPARATOR
HYSTERESIS COMPARATOR
BPF
LIMITER AMP
VGC
HEAD AMP
IN
ABLC
GND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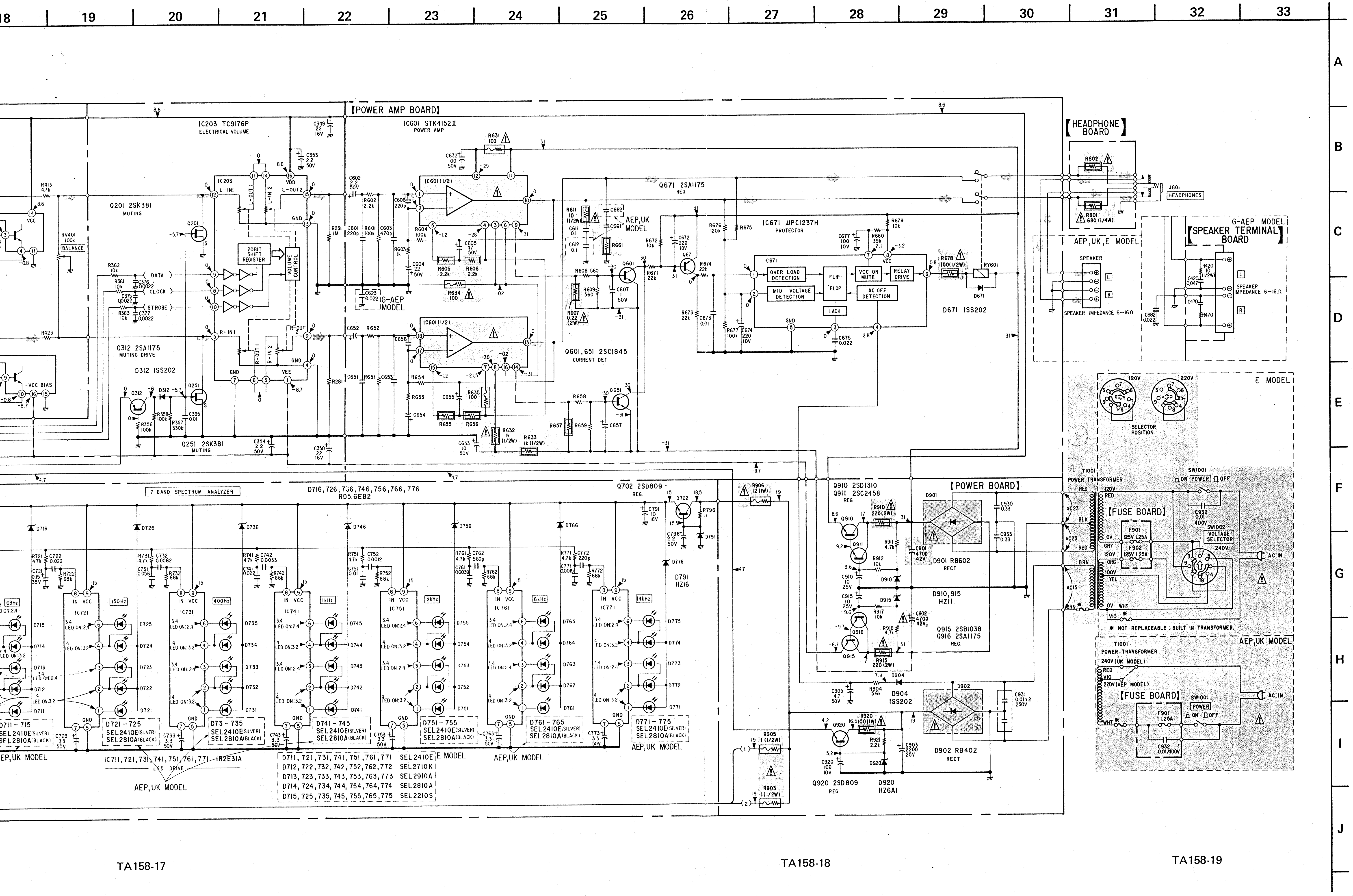
CONTROL BOARD (1/3)
GRAPHIC EQ BOARD (1/2)
CONTROL BOARD (1/3)
PHONO BOARD (1/3)
POWER AMP BOARD
IC401 - 403 M5226P
GRAPHIC EQ AMP
IC203 TC9176P
ELECTRICAL VOLUME
IC601 STK4152II
POWER AMP
IC201 M5218L
LINE AMP
PIN101-5 PRE OUT L
PIN101-6 PRE OUT R
GRAPHIC EQUALIZER
63Hz
150Hz
400Hz
1kHz
3kHz
6kHz
14kHz
RV401 100k BALANCE
Q201 2SK381 MUTING
Q312 2SA1175 MUTING DRIVE
D312 1SS202
Q251 2SK381 MUTING
Q601, 651 2SC18
CURRENT DET
20BIT SHIFT REGISTER
VOLUME CONTROL
DATA
CLOCK
STROBE
G-AEP MODEL
SPM BOARD (1/4)
D301, 302 1SS202
D321 HZ1.5
D303 1SS202
VOLUME
SW701
SW702
SW703 MUTING -20dB
RESET VDD
UP
DOWN
MUTE
TUNER
PHONO
CD/AUX
TAPE
BAND
X IN
X OUT
CN VSS
DATA IN
SENS
VOLUME CONTROL KEY
POWER OFF
POWER ON
IC301 M50765-440SP
REMOTE CONTROL SIGNAL DECODER
2.5μSec
3.6Vp-p
Q320-325 2SA1175
LED DRIVE
LED 1
LED 2
LED 3
LED 4
LED 5
MUTE LED
VOLUME INDICATE
VOL LEVEL
D701-705 SEL2210S-C
D706 AA5535S
SPM BOARD (1/4)
Q701 2SC2458
AMP
PHR BOARD
Q301 2SC2458
Q302 2SA1175
INVERTER
IC011 CX20106
REMOTE CONTROL SIGNAL RECEIVER
HYSTERESIS COMPARATOR
INTEGRATOR
DETECTOR/COMPARATOR
BPF
VGC
LIMITER AMP
HEAD AMP
ABLC
D011 PH302B
REMOTE SENSOR
7 BAND SPECTRUM ANALYZER
D716, 726, 736, 746, 756, 766, 776 RD5.6EB2
MULTI LEVEL COMPARATOR
CONSTANT CURRENT SOURCE
IC711
IC721
IC731
IC741
IC751
IC761
IC771
D711-715 SEL2410E(SILVER) SEL2810A(BLACK)
D721-725 SEL2410E(SILVER) SEL2810A(BLACK)
D731-735 SEL2410E(SILVER) SEL2810A(BLACK)
D741-745 SEL2410E(SILVER) SEL2810A(BLACK)
D751-755 SEL2410E(SILVER) SEL2810A(BLACK)
D761-765 SEL2410E(SILVER) SEL2810A(BLACK)
AEP, UK MODEL
IC711, 721, 731, 741, 751, 761, 771 IR2E31A
LED DRIVE
AEP, UK MODEL
D711, 721, 731, 741, 751, 761, 771 SEL2410E
D712, 722, 732, 742, 752, 762, 772 SEL2710K
D713, 723, 733, 743, 753, 763, 773 SEL2910A
D714, 724, 734, 744, 754, 764, 774 SEL2810A
D715, 725, 735, 745, 755, 765, 775 SEL2210S
E MODEL
AEP, UK MODEL
2SC2458
FFER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A
B
C
D
E
F
G
H
I
J
【POWER AMP BOARD】
IC203 TC9176P
ELECTRICAL VOLUME
IC601 STK4152Ⅱ
POWER AMP
Q201 2SK381
MUTING
Q312 2SA1175
MUTING DRIVE
D312 1SS202
Q251 2SK381
MUTING
20BIT SHIFT REGISTER
VOLUME CONTROL
DATA
CLOCK
STROBE
RV401 100k BALANCE
-VCC BIAS
Q671 2SA1175
REG
IC671 μPC1237H
PROTECTOR
OVER LOAD DETECTION
MID VOLTAGE DETECTION
FLIP-FLOP
LACH
VCC ON MUTE
RELAY DRIVE
AC OFF DETECTION
RY601
D671 1SS202
Q601,651 2SC1845
CURRENT DET
AEP,UK MODEL
G-AEP MODEL
【HEADPHONE BOARD】
J801 HEADPHONES
AEP,UK,E MODEL
SPEAKER
SPEAKER IMPEDANCE 6-16Ω
G-AEP MODEL
【SPEAKER TERMINAL BOARD】
SPEAKER IMPEDANCE 6-16Ω
E MODEL
SELECTOR POSITION
120V
220V
7 BAND SPECTRUM ANALYZER
D716,726,736,746,756,766,776
RD5.6EB2
Q702 2SD809
REG.
D791 HZ16
63Hz
150Hz
400Hz
1kHz
3kHz
6kHz
14kHz
IC721
IC731
IC741
IC751
IC761
IC771
D711-715
SEL2410E(SILVER)
SEL2810A(BLACK)
D721-725
D73-735
D741-745
D751-755
D761-765
D771-775
AEP,UK MODEL
IC711,721,731,741,751,761,771 IR2E31A
LED DRIVE
D711,721,731,741,751,761,771 SEL2410E
D712,722,732,742,752,762,772 SEL2710K
D713,723,733,743,753,763,773 SEL2910A
D714,724,734,744,754,764,774 SEL2810A
D715,725,735,745,755,765,775 SEL2210S
E MODEL
【POWER BOARD】
Q910 2SD1310
Q911 2SC2458
REG.
D901 RB602
RECT
D910,915
HZ11
Q915 2SB1038
Q916 2SA1175
REG.
D904
1SS202
D902 RB402
RECT
Q920 2SD809
REG.
D920
HZ6A1
T1001
POWER TRANSFORMER
SW1001
POWER
ON
OFF
【FUSE BOARD】
F901 125V 1.25A
F902 125V 1.25A
SW1002
VOLTAGE SELECTOR
240V
AC IN
※ NOT REPLACEABLE : BUILT IN TRANSFORMER.
AEP,UK MODEL
T1001
POWER TRANSFORMER
240V (UK MODEL)
220V (AEP MODEL)
【FUSE BOARD】
F901 T1.25A
C932 0.01 400V

TA158-17

TA158-18

TA158-19

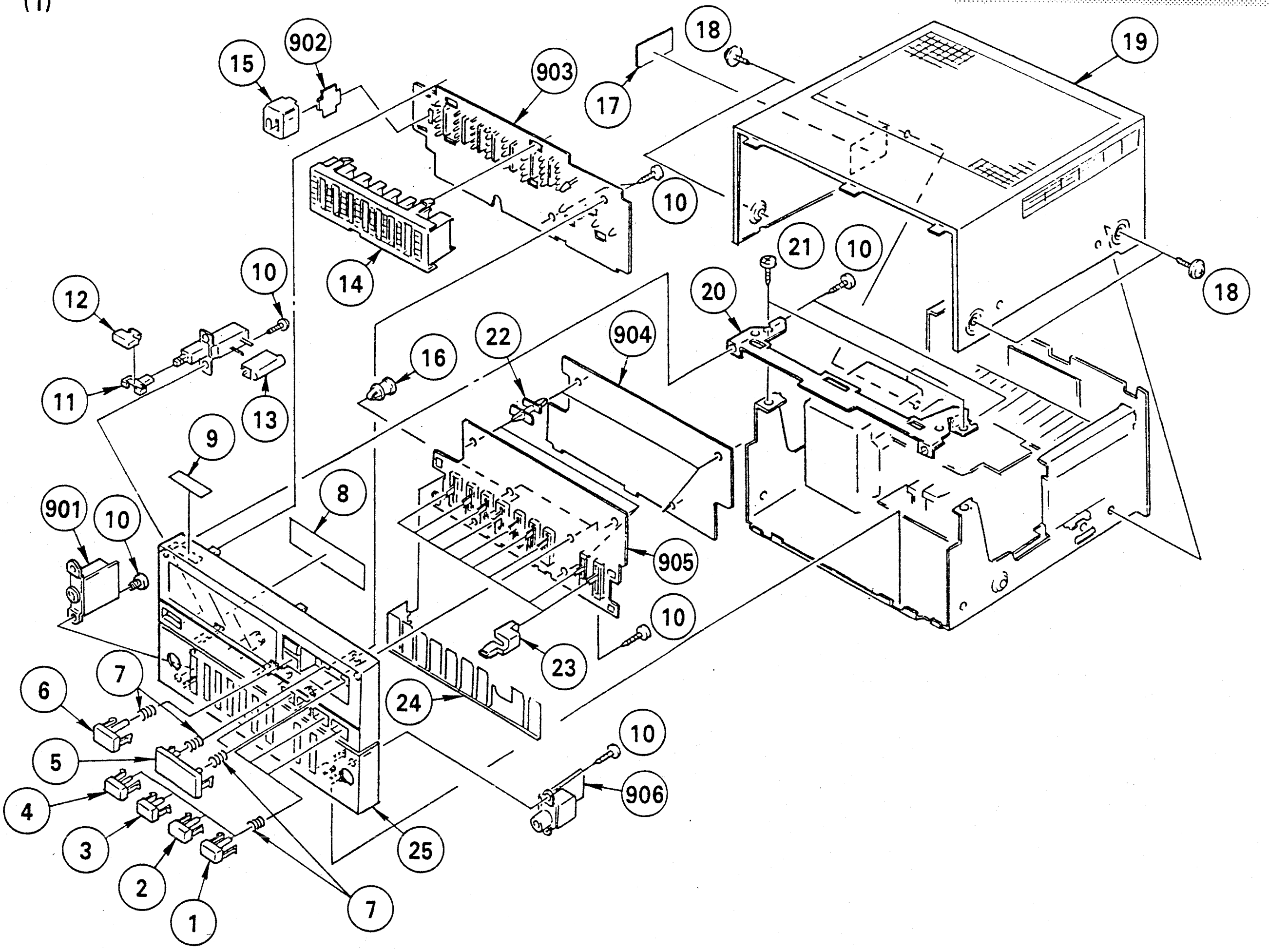
6. EXPLODED VIEWS AND PARTS LIST

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

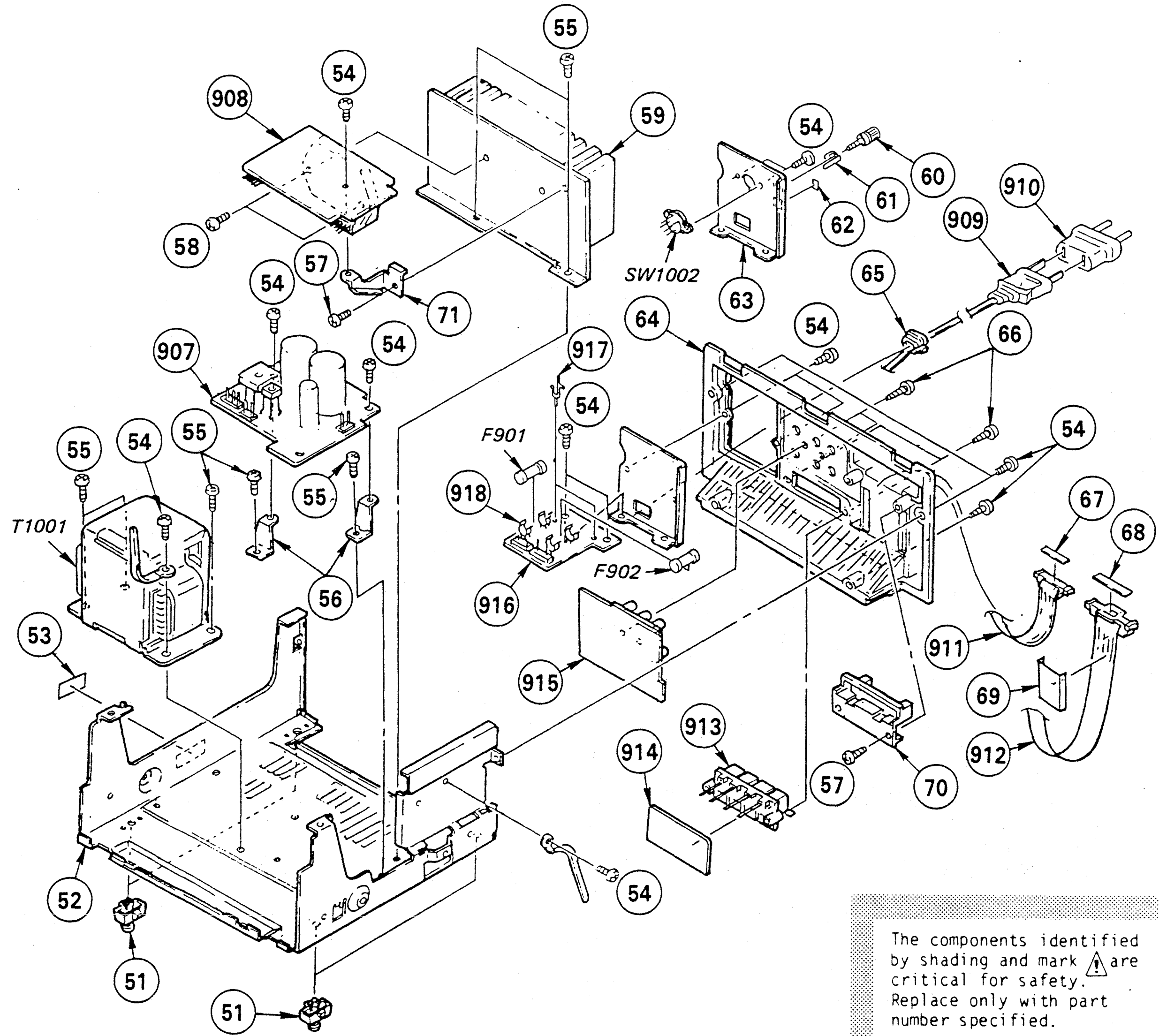
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

(1)



No.	Part No.	Description	Remarks
1	4-910-087-51	(BLACK)....BUTTON (B), SQUARE	
	4-910-089-51	(SILVER)...BUTTON (S), SQUARE	
2	4-910-087-41	(BLACK)....BUTTON (B), SQUARE	
	4-910-089-41	(SILVER)...BUTTON (S), SQUARE	
3	4-910-087-31	(BLACK)....BUTTON (B), SQUARE	
	4-910-089-31	(SILVER)...BUTTON (S), SQUARE	
4	4-910-087-21	(BLACK)....BUTTON (B), SQUARE	
	4-910-089-21	(SILVER)...BUTTON (S), SQUARE	
5	4-910-094-01	(SILVER)...BUTTON (UP-DOWN), SQUARE	
	4-910-094-11	(BLACK)....BUTTON (UP-DOWN), SQUARE	
6	4-910-087-61	(BLACK)....BUTTON (B), SQUARE	
	4-910-089-61	(SILVER)...BUTTON (S), SQUARE	
7	4-886-032-00	SPRING, COMPRESSION	
8	*4-910-099-01	(SILVER)...PLATE (8 GANG), INDICATION	
	*4-910-099-11	(BLACK)....PLATE (8 GANG), INDICATION	
9	*3-701-690-00	(UK)....LABEL, MADE IN JAPAN	
10	7-685-646-71	SCREW +BVTP 3X8 TYPE2	
11	4-910-058-01	JOINT, KNOB	
12	4-910-056-01	(SILVER)...KNOB, POWER	
	4-910-056-11	(BLACK)....KNOB, POWER	
13	3-575-524-00	COVER, POWER SWITCH	
14	*4-910-306-01	HOUSE (8 GANG), LAMP	
15	*4-910-301-01	PLATE, SHIELD	
16	*3-669-610-00	SPACER	
17	*4-910-018-01	(E)......LABEL, MODEL NUMBER	
	*4-910-020-01	(UK).....LABEL, MODEL NUMBER	
	*4-910-021-01	(G-AEP)..LABEL, MODEL NUMBER	
	*4-910-019-01	(AEP)....LABEL, MODEL NUMBER (AE)	
	*4-910-019-11	(AEP)....LABEL, MODEL NUMBER (AE)	
18	4-886-821-01	(BLACK)....SCREW, M3 CASE	
	4-886-821-11	(SILVER)...SCREW, M3 CASE	
19	4-910-078-21	(SILVER)...CASE	
	4-910-078-31	(BLACK)....CASE	
20	*4-910-068-01	JOINT	
21	7-685-871-01	SCREW +BVTT 3X6 (S)	
22	3-659-619-01	HOLDER, PC BOARD	
23	4-909-977-11	(SILVER)...KNOB, GRAPHIC EQUALIZER	
	4-909-977-21	(BLACK)....KNOB, GRAPHIC EQUALIZER	
24	*4-910-307-01	PLATE (H), BLIND	
25	X-4910-015-1	(SILVER)...PANEL ASSY, FRONT	
	X-4910-015-2	(BLACK)....PANEL ASSY, FRONT	
901	*1-615-501-11	PC BOARD, HP	
902	*1-615-502-11	PC BOARD, PHR	
903	*A-4380-058-A	(AEP,UK)....MOUNTED PCB, SPM	
903	*A-4380-057-A	(E)....MOUNTED PCB, SPM	
904	*A-4375-212-A	MOUNTED PCB, CONTROL	
905	*1-615-499-11	PC BOARD, GE	
906	*1-615-500-11	PC BOARD, MIC	
SW1001	⚠ 1-553-318-51	SWITCH, PUSH (AC POWER)(1 KEY)	

(2)



The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

No.	Part No.	Description	Remarks
51	X-4902-937-1	FOOT ASSY, RUBBER	
52	*4-902-974-01	CHASSIS	
53	*3-701-030-00	LABEL, SERIAL NUMBER	
54	7-685-871-01	SCREW +BVTT 3X6 (S)	
55	7-682-546-04	SCREW +BVTT 3X5 (S)	
56	*4-910-060-01	BRACKET, PC BOARD	
57	7-685-646-71	SCREW +BVTP 3X8 TYPE2	
58	7-685-150-14	SCREW +BVTP 3X16 TYPE2 SLIT	
59	*4-910-077-01	HEAT SINK	
60	3-706-165-01	(G-AEP)...SCREW	
61	3-701-993-00	(G-AEP)...SPACER, TERMINAL	
62	*3-534-929-00	(G-AEP)...LABEL	
63	*4-910-073-11	(E)........BRACKET, INLET	
	*4-910-073-01	(AEP,UK)...BRACKET, INLET	
64	4-910-079-01	PLATE, JACK	
65	3-703-244-00	(AEP,UK)...BUSHING (2104), CORD	
	3-703-571-00	(E)........BUSHING, CORD	
66	7-685-647-14	SCREW +BVTP 3X10 TYPE2 N-S	
67	*4-910-066-01	(AEP)....LABEL (A), CONNECTOR	
68	*4-910-067-01	(AEP)....LABEL (B), CONNECTOR	
69	4-884-875-00	LABEL (A) (CONNECTOR), CAUTION	
70	*4-910-302-01	HOLDER (H), WIRE	
71	*4-910-064-01	BRACKET (H), PC BOARD	
907	*A-4394-354-A	MOUNTED PCB, POWER	
908	*A-4388-447-A	MOUNTED PCB, POWER AMP	
909	⚠.1-534-817-XX	(AEP)...CORD, POWER, EURO PLUG	
	⚠.1-551-884-00	(UK)....CORD, POWER	
	⚠.1-551-472-00	(E).....CORD, POWER	
910	⚠.1-526-565-00	(E)....AC PLUG ADAPTOR	
911	1-557-898-11	CORD (WITH CONNECTOR)	
912	1-557-899-11	CORD (WITH CONNECTOR)	
913	1-536-705-21	TERMINAL BOARD (SP)	
914	1-616-486-11	(G-AEP)...PC BOARD, SPEAKER TERMINAL	
915	*1-615-503-11	PC BOARD, PHONO	
916	*1-615-442-11	PC BOARD, FUSE	
917	1-535-416-00	TERMINAL	
918	1-533-162-00	HOLDER, FUSE	
F901	⚠.1-532-285-00	FUSE, TIME-LAG	
F902	⚠.1-532-285-00	(E)...FUSE, TIME-LAG	
SW1002	⚠.1-526-576-51	(E)...SELECTOR, POWER WOLTAGE	
T1001	⚠.1-448-133-11	(E)........TRANSFORMER, POWER	
T1001	⚠.1-448-134-11	(AEP,UK)...TRANSFORMER, POWER	

7. ELECTRICAL PARTS LIST

NOTE:

- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
· All resistors are in ohms.
· F : nonflammable

COILS
· MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC,
UPD...: μPD...

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	*1-615-501-11	PC BOARD, HP			
902	*1-615-502-11	PC BOARD, PHR			
903	*A-4380-058-A	(AEP,UK)...MOUNTED PCB, SPM			
903	*A-4380-057-A	(E)........MOUNTED PCB, SPM			
904	*A-4375-212-A	MOUNTED PCB, CONTROL			
905	*1-615-499-11	PC BOARD, GE			
906	*1-615-500-11	PC BOARD, MIC			
907	*A-4394-354-A	MOUNTED PCB, POWER			
908	*A-4388-447-A	MOUNTED PCB, POWER AMP			
909	⚠.1-534-817-XX	(AEP)...CORD, POWER, EULO PLUG			
909	⚠.1-551-884-00	(UK)....CORD, POWER			
909	⚠.1-551-472-00	(E).....CORD, POWER			
910	⚠.1-526-565-00	(E)....AC PLUG ADAPTOR			
911	1-557-898-11	CORD (WITH CONNECTOR)			
912	1-557-899-11	CORD (WITH CONNECTOR)			
913	1-536-705-21	TERMINAL BOARD (SP)			
914	1-616-486-11	(G-AEP)...PC BOARD, SPEAKER TERMINAL			
915	*1-615-503-11	PC BOARD, PHONO			
916	*1-615-442-11	PC BOARD, FUSE			
917	1-535-416-00	TERMINAL			
918	1-533-162-00	HOLDER, FUSE			
BP001	*1-535-139-00	BASE POST 22MM (10MM PITCH) 2P			
BP002	*1-535-139-00	BASE POST 22MM (10MM PITCH) 2P			
BP601	*1-508-799-00	BASE POST (U TYPE)			
BP901	*1-535-116-00	TERMINAL			
BP902	*1-535-115-00	TERMINAL			
BP903	*1-535-115-00	TERMINAL			
C011	1-131-347-00	TANTALUM	1MF	10%	35V
C012	1-131-368-00	TANTALUM	3.3MF	10%	16V
C013	1-131-377-71	TANTALUM	10MF	20%	10V
C014	1-102-112-00	CERAMIC	330PF	10%	50V
C101	1-123-612-00	ELECT	2.2MF	20%	50V
C102	1-162-288-31	CERAMIC	330PF	10%	50V
C103	1-123-612-00	ELECT	2.2MF	20%	50V
C104	1-110-197-00	MYLAR	0.0015MF	5%	50V
C105	1-110-204-00	MYLAR	0.0056MF	5%	50V
C106	1-123-612-00	ELECT	2.2MF	20%	50V
C107	1-123-617-00	ELECT	10MF	20%	16V
C111	1-136-165-00	FILM	0.1MF	5%	50V
C115	1-162-294-31	CERAMIC	0.001MF	10%	50V
C116	1-162-291-31	(G-AEP)...CERAMIC	560P	10%	50V
C117	1-162-291-31	(G-AEP)...CERAMIC	560P	10%	50V
C151	1-123-612-00	ELECT	2.2MF	20%	50V
C152	1-162-288-31	CERAMIC	330PF	10%	50V
C153	1-123-612-00	ELECT	2.2MF	20%	50V
C154	1-162-301-31	CERAMIC	0.0015MF	20%	16V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C155	1-110-204-00	MYLAR	0.0056MF	5%	50V
C156	1-123-612-00	ELECT	2.2MF	20%	50V
C157	1-123-617-00	ELECT	10MF	20%	16V
C165	1-162-294-31	CERAMIC	0.001MF	10%	50V
C166	1-162-291-31	(G-AEP)....CERAMIC	560P	10%	50V
C167	1-162-291-31	(G-AEP)....CERAMIC	560P	10%	50V
C201	1-123-612-00	ELECT	2.2MF	20%	50V
C202	1-162-288-31	CERAMIC	330PF	10%	50V
C212	1-162-282-31	CERAMIC	100PF	10%	50V
C251	1-123-612-00	ELECT	2.2MF	20%	50V
C252	1-162-288-31	CERAMIC	330PF	10%	50V
C262	1-162-282-31	CERAMIC	100PF	10%	50V
C303	1-162-284-31	CERAMIC	150PF	10%	50V
C304	1-162-284-31	CERAMIC	150PF	10%	50V
C305	1-123-617-00	ELECT	10MF	20%	16V
C310	1-131-343-00	TANTALUM	0.22MF	10%	35V
C311	1-123-622-00	ELECT	22MF	20%	16V
C312	1-123-617-00	ELECT	10MF	20%	16V
C315	1-162-306-31	CERAMIC	0.01MF	30%	16V
C316	1-162-306-31	CERAMIC	0.01MF	30%	16V
C317	1-123-616-00	ELECT	4.7MF	20%	25V
C318	1-123-612-00	ELECT	2.2MF	20%	50V
C349	1-123-622-00	ELECT	22MF	20%	16V
C350	1-123-622-00	ELECT	22MF	20%	16V
C351	1-123-612-00	ELECT	2.2MF	20%	50V
C352	1-123-612-00	ELECT	2.2MF	20%	50V
C353	1-123-612-00	ELECT	2.2MF	20%	50V
C354	1-123-612-00	ELECT	2.2MF	20%	50V
C355	1-123-617-00	ELECT	10MF	20%	16V
C356	1-123-622-00	ELECT	22MF	20%	16V
C357	1-123-617-00	ELECT	10MF	20%	16V
C375	1-162-302-31	CERAMIC	0.0022MF	30%	16V
C376	1-162-302-31	CERAMIC	0.0022MF	30%	16V
C377	1-162-302-31	CERAMIC	0.0022MF	30%	16V
C381	1-162-306-31	CERAMIC	0.01MF	30%	16V
C382	1-162-306-31	CERAMIC	0.01MF	30%	16V
C383	1-162-306-31	CERAMIC	0.01MF	30%	16V
C385	1-162-294-31	CERAMIC	0.001MF	10%	50V
C386	1-162-306-31	CERAMIC	0.01MF	30%	16V
C387	1-162-294-31	CERAMIC	0.001MF	10%	50V
C388	1-123-617-00	ELECT	10MF	20%	16V
C395	1-162-306-31	CERAMIC	0.01MF	30%	16V
C399	1-162-294-31	CERAMIC	0.001MF	10%	50V
C420	1-136-161-00	(G-AEP)...FILM	0.047MF	5%	50V
C413	1-131-371-00	TANTALUM	10MF	10%	16V
C419	1-162-288-31	CERAMIC	330PF	10%	50V
C423	1-131-371-00	TANTALUM	10MF	10%	16V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C431	1-131-408-00	TANTALUM	1MF	10%	25V
C432	1-131-344-00	TANTALUM	0.33MF	10%	35V
C433	1-131-342-00	TANTALUM	0.15MF	10%	35V
C434	1-136-163-00	FILM	0.068MF	5%	50V
C435	1-136-157-00	FILM	0.022MF	5%	50V
C436	1-161-051-00	CERAMIC	0.01MF	10%	50V
C437	1-161-046-11	CERAMIC	0.0039MF	10%	50V
C438	1-136-164-00	FILM	0.082MF	5%	50V
C439	1-136-158-00	FILM	0.027MF	5%	50V
C440	1-136-154-00	FILM	0.012MF	5%	50V
C441	1-161-047-00	CERAMIC	0.0047MF	10%	50V
C442	1-161-042-11	CERAMIC	0.0018MF	10%	50V
C443	1-162-293-31	CERAMIC	820PF	10%	50V
C444	1-162-288-31	CERAMIC	330PF	10%	50V
C451	1-131-371-00	TANTALUM	10MF	10%	16V
C452	1-131-371-00	TANTALUM	10MF	10%	16V
C461	1-162-306-31	CERAMIC	0.01MF	30%	16V
C469	1-162-288-31	CERAMIC	330PF	10%	50V
C470	1-136-161-00	(G-AEP)...FILM	0.047MF	5%	50V
C471	1-131-408-00	TANTALUM	1MF	10%	25V
C472	1-131-344-00	TANTALUM	0.33MF	10%	35V
C473	1-131-342-00	TANTALUM	0.15MF	10%	35V
C474	1-136-163-00	FILM	0.068MF	5%	50V
C475	1-136-157-00	FILM	0.022MF	5%	50V
C476	1-161-051-00	CERAMIC	0.01MF	10%	50V
C477	1-161-046-11	CERAMIC	0.0039MF	10%	50V
C478	1-136-164-00	FILM	0.082MF	5%	50V
C479	1-136-158-00	FILM	0.027MF	5%	50V
C480	1-136-154-00	FILM	0.012MF	5%	50V
C481	1-161-047-00	CERAMIC	0.0047MF	10%	50V
C482	1-161-042-11	CERAMIC	0.0018MF	10%	50V
C483	1-162-293-31	CERAMIC	820PF	10%	50V
C484	1-162-288-31	CERAMIC	330PF	10%	50V
C502	1-123-380-00	ELECT	1MF	20%	50V
C503	1-161-055-00	CERAMIC	0.022MF	20%	25V
C504	1-123-356-00	ELECT	10MF	20%	16V
C505	1-123-380-00	ELECT	1MF	20%	50V
C601	1-162-286-31	CERAMIC	220PF	10%	50V
C602	1-123-381-00	ELECT	2.2MF	20%	50V
C603	1-162-290-31	CERAMIC	470PF	10%	50V
C604	1-123-357-00	ELECT	22MF	20%	50V
C605	1-123-359-00	ELECT	47MF	20%	50V
C606	1-162-286-31	CERAMIC	220PF	10%	50V
C607	1-123-380-00	ELECT	1MF	20%	50V
C611	1-136-165-00	FILM	0.1MF	5%	50V
C612	1-136-165-00	(AEP,UK)...FILM	0.1MF	5%	50V
C623	1-161-055-00	(G-AEP)....CERAMIC	0.022MF	10%	50V
C632	1-123-360-00	ELECT	100MF	20%	50V
C633	1-123-356-00	ELECT	10MF	20%	50V
C651	1-162-286-31	CERAMIC	220PF	10%	50V
C652	1-123-381-00	ELECT	2.2MF	20%	50V
C653	1-162-290-31	CERAMIC	470PF	10%	50V
C654	1-123-357-00	ELECT	22MF	20%	50V
C655	1-123-359-00	ELECT	47MF	20%	50V
C656	1-162-286-31	CERAMIC	220PF	10%	50V
C657	1-123-380-00	ELECT	1MF	20%	50V

The components identified
by shading and mark ⚠ are
critical for safety.
Replace only with part
number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C661	1-136-165-00	FILM	0.1MF	5%	50V
C662	1-136-165-00	(AEP,UK)...FILM	0.1MF	5%	50V
C672	1-123-308-00	ELECT	220MF	20%	10V
C673	1-162-306-31	CERAMIC	0.01MF	30%	16V
C674	1-123-308-00	ELECT	220MF	20%	10V
C675	1-136-157-00	FILM	0.022MF	5%	50V
C677	1-123-307-00	ELECT	100MF	20%	10V
C682	1-161-055-00	(G-AEP)....CERAMIC	0.022MF	10%	50V
C701	1-123-612-00	ELECT	2.2MF	20%	50V
C702	1-123-617-00	ELECT	10MF	20%	16V
C711	1-131-344-00	TANTALUM	0.33MF	10%	35V
C712	1-136-161-00	FILM	0.047MF	5%	50V
C713	1-123-613-00	ELECT	3.3MF	20%	50V
C721	1-131-342-00	TANTALUM	0.15MF	10%	35V
C722	1-161-055-00	CERAMIC	0.022MF	10%	25V
C723	1-123-613-00	ELECT	3.3MF	20%	50V
C731	1-136-162-00	FILM	0.056MF	5%	50V
C732	1-161-012-00	CERAMIC	0.0082MF	10%	25V
C733	1-123-613-00	ELECT	3.3MF	20%	50V
C741	1-161-055-00	CERAMIC	0.022MF	10%	25V
C742	1-161-045-00	CERAMIC	0.0033MF	10%	25V
C743	1-123-613-00	ELECT	3.3MF	20%	50V
C751	1-161-013-00	CERAMIC	0.01MF	10%	25V
C752	1-161-040-00	CERAMIC	0.0012MF	10%	25V
C753	1-123-613-00	ELECT	3.3MF	20%	50V
C761	1-161-046-00	CERAMIC	0.0039MF	10%	25V
C762	1-162-291-31	CERAMIC	560PF	10%	50V
C763	1-123-613-00	ELECT	3.3MF	20%	50V
C771	1-161-003-00	CERAMIC	0.0015MF	10%	25V
C772	1-162-286-31	CERAMIC	220PF	10%	50V
C773	1-123-613-00	ELECT	3.3MF	20%	50V
C791	1-123-617-00	ELECT	10MF	20%	16V
C795	1-162-306-31	CERAMIC	0.01MF	30%	16V
C796	1-123-612-00	ELECT	2.2MF	20%	50V
C901 ⚠	**1-124-362-00**	**ELECT**	**4700MF**	**20%**	**42V**
C902 ⚠	**1-124-362-00**	**ELECT**	**4700MF**	**20%**	**42V**
C903	1-123-338-00	ELECT	2200MF	20%	25V
C905	1-123-369-00	ELECT	4.7MF	20%	50V
C910	1-123-356-00	ELECT	10MF	20%	25V
C915	1-123-356-00	ELECT	10MF	20%	25V
C920	1-123-307-00	ELECT	100MF	20%	10V
C930	1-136-171-00	FILM	0.33MF	5%	50V
C931	1-102-394-00	CERAMIC	0.01MF		250V
C932 ⚠	**1-161-744-00**	**CERAMIC**	**0.01MF**		**400V**
C933	1-136-171-00	FILM	0.33MF	5%	50V
CN201	*1-560-061-00	PIN, CONNECTOR 3P			
CN202	*1-560-064-00	PIN, CONNECTOR 6P			
CN203	*1-560-063-00	PIN, CONNECTOR 5P			
CN204	*1-560-066-00	PIN, CONNECTOR 10P			
CN205	*1-560-060-00	PIN, CONNECTOR 2P			
CN206	*1-560-065-00	PIN, CONNECTOR 8P			
CN208	*1-564-496-11	PIN, CONNECTOR 3P			
CN210	*1-560-061-00	PIN, CONNECTOR 3P			
CN216	*1-560-062-00	PIN, CONNECTOR 4P			
CN401	*1-564-501-11	PIN, CONNECTOR 8P			
CN402	*1-564-496-11	PIN, CONNECTOR 3P			
CN403	*1-564-112-21	PIN, CONNECTOR 3P			

ELECTRICAL PARTS

Ref.No.	Part No.	Description
CN601	*1-560-070-00	BASE POST
CN603	*1-560-070-00	BASE POST
CN903	*1-560-063-00	PIN, CONNECTOR 5P
D011	8-719-110-32	DIODE PH302B
D301	8-719-107-94	DIODE 1SS202-1
D302	8-719-107-94	DIODE 1SS202-1
D303	8-719-107-94	DIODE 1SS202-1
D304	8-719-107-94	DIODE 1SS202-1
D311	8-719-107-94	DIODE 1SS202-1
D312	8-719-107-94	DIODE 1SS202-1
D321	8-719-910-62	DIODE HZ6A2L
D671	8-719-107-94	DIODE 1SS202-1
D701	8-719-301-38	DIODE SEL2210S-C
D702	8-719-301-38	DIODE SEL2210S-C
D703	8-719-301-38	DIODE SEL2210S-C
D704	8-719-301-38	DIODE SEL2210S-C
D705	8-719-301-38	DIODE SEL2210S-C
D706	8-719-707-80	DIODE AA5535S
D711	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D711	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D711	8-719-301-43	(E).........DIODE SEL2410E-C
D712	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D712	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D712	8-719-300-95	(E).........DIODE SEL2710K
D713	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D713	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D713	8-719-301-60	(E).........DIODE SEL2910A-C
D714	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D714	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D714	8-719-301-52	(E).........DIODE SEL2810A-C
D715	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D715	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D715	8-719-301-38	(E).........DIODE SEL2210S-C
D716	8-719-100-35	DIODE RD5.6E-B2
D721	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D721	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D721	8-719-301-43	(E).........DIODE SEL2410E-C
D722	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D722	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D722	8-719-300-95	(E).........DIODE SEL2710K
D723	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D723	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D723	8-719-301-60	(E).........DIODE SEL2910A-C
D724	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D724	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D724	8-719-301-52	(E).........DIODE SEL2810A-C
D725	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D725	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D725	8-719-301-38	(E).........DIODE SEL2210S-C
D726	8-719-100-35	DIODE RD5.6E-B2
D731	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D731	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D731	8-719-301-43	(E).........DIODE SEL2410E-C
D732	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D732	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D732	8-719-300-95	(E).........DIODE SEL2710K

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D733	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D733	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D733	8-719-301-60	(E).........DIODE SEL2910A-C
D734	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D734	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D734	8-719-301-52	(E).........DIODE SEL2810A-C
D735	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D735	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D735	8-719-301-38	(E).........DIODE SEL2210S-C
D736	8-719-100-35	DIODE RD5.6E-B2
D741	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D741	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D741	8-719-301-43	(E).........DIODE SEL2410E-C
D742	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D742	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D742	8-719-300-95	(E).........DIODE SEL2710K
D743	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D743	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D743	8-719-301-60	(E).........DIODE SEL2910A-C
D744	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D744	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D744	8-719-301-52	(E).........DIODE SEL2810A-C
D745	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D745	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D745	8-719-301-38	(E).........DIODE SEL2210S-C
D746	8-719-100-35	DIODE RD5.6E-B2
D751	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D751	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D751	8-719-301-43	(E).........DIODE SEL2410E-C
D752	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D752	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D752	8-719-300-95	(E).........DIODE SEL2710K
D753	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D753	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D753	8-719-301-60	(E).........DIODE SEL2910A-C
D754	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D754	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D754	8-719-301-52	(E).........DIODE SEL2810A-C
D755	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D755	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D755	8-719-301-38	(E).........DIODE SEL2210S-C
D756	8-719-100-35	DIODE RD5.6E-B2
D761	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D761	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D761	8-719-301-43	(E).........DIODE SEL2410E-C
D762	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D762	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D762	8-719-300-95	(E).........DIODE SEL2710K
D763	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D763	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D763	8-719-301-60	(E).........DIODE SEL2910A-C
D764	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D764	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D764	8-719-301-52	(E).........DIODE SEL2810A-C

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D765	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D765	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D765	8-719-301-38	(E).........DIODE SEL2210S-C
D766	8-719-100-35	DIODE RD5.6E-B2
D771	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D771	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D771	8-719-301-43	(E).........DIODE SEL2410E-C
D772	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D772	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D772	8-719-300-95	(E).........DIODE SEL2710K
D773	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D773	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D773	8-719-301-60	(E).........DIODE SEL2910A-C
D774	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D774	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D774	8-719-301-52	(E).........DIODE SEL2810A-C
D775	8-719-301-43	(SILVER:AEP,UK)...DIODE SEL2410E-C
D775	8-719-301-52	(BLACK:AEP,UK)....DIODE SEL2810A-C
D775	8-719-301-38	(E).........DIODE SEL2210S-C
D776	8-719-100-35	DIODE RD5.6E-B2
D781	8-719-301-52	DIODE SEL2810A-C
D782	8-719-301-52	DIODE SEL2810A-C
D783	8-719-301-52	DIODE SEL2810A-C
D784	8-719-301-52	DIODE SEL2810A-C
D791	8-719-901-62	DIODE HZ16-2L
D901 ⚠.	8-719-301-65	DIODE RB602
D902	8-719-300-57	DIODE RB402
D904	8-719-107-94	DIODE 1SS202-1
D910	8-719-910-12	DIODE HZ11A2L
D915	8-719-910-12	DIODE HZ11A2L
D920	8-719-992-61	DIODE HZ6A1
DIP101*	1-562-251-00	SOCKET, CONNECTOR 6P
DIP102*	1-562-250-00	SOCKET, CONNECTOR 5P
DIP901*	1-562-249-00	SOCKET, CONNECTOR 4P
DIP902*	1-562-327-00	SOCKET, CONNECTOR 3P
DIP903*	1-562-250-00	SOCKET, CONNECTOR 5P
F901 ⚠.	1-532-285-00	FUSE, TIME-LAG
F902 ⚠.	1-532-285-00	(E)...FUSE, TIME-LAG
IC011	8-752-010-60	IC CX20106
IC101	8-759-600-02	IC M5218L
IC201	8-759-600-02	IC M5218L
IC202	8-759-800-33	IC LC7815H
IC203	8-759-204-30	IC TC9176P
IC301	8-759-602-60	IC M50765-440SP
IC401	8-759-602-04	IC M5226P
IC402	8-759-602-04	IC M5226P
IC403	8-759-602-04	IC M5226P
IC601 ⚠.	8-749-941-52	IC STK4152II
IC671	8-759-101-23	IC UPC1237H
IC711	8-759-913-80	IC IR2E31
IC721	8-759-913-80	IC IR2E31
IC731	8-759-913-80	IC IR2E31
IC741	8-759-913-80	IC IR2E31
IC751	8-759-913-80	IC IR2E31
IC761	8-759-913-80	IC IR2E31
IC771	8-759-913-80	IC IR2E31

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
J501	1-507-984-11	JACK (LARGE TYPE)(MIC)			
J801	1-507-983-11	JACK (LARGE TYPE)(HEADPHONES)			
OS301	1-527-532-00	OSCILLATOR, CERAMIC			
PIN101	1-507-914-21	JACK, PIN 6P			
Q201	8-729-600-08	TRANSISTOR 2SK381-E			
Q251	8-729-600-08	TRANSISTOR 2SK381-E			
Q301	8-729-606-33	TRANSISTOR 2SC2603F			
Q302	8-729-117-54	TRANSISTOR 2SA1175			
Q303	8-729-117-54	TRANSISTOR 2SA1175			
Q304	8-729-606-33	TRANSISTOR 2SC2603F			
Q305	8-729-606-33	TRANSISTOR 2SC2603F			
Q310	8-729-117-54	TRANSISTOR 2SA1175			
Q311	8-729-117-54	TRANSISTOR 2SA1175			
Q312	8-729-117-54	TRANSISTOR 2SA1175			
Q320	8-729-117-54	TRANSISTOR 2SA1175			
Q321	8-729-117-54	TRANSISTOR 2SA1175			
Q322	8-729-117-54	TRANSISTOR 2SA1175			
Q323	8-729-117-54	TRANSISTOR 2SA1175			
Q324	8-729-117-54	TRANSISTOR 2SA1175			
Q325	8-729-117-54	TRANSISTOR 2SA1175			
Q326	8-729-606-33	TRANSISTOR 2SC2603F			
Q501	8-729-606-33	TRANSISTOR 2SC2603F			
Q601	8-729-108-05	TRANSISTOR 2SC1841-PA			
Q651	8-729-108-05	TRANSISTOR 2SC1841-PA			
Q671	8-729-117-54	TRANSISTOR 2SA1175			
Q701	8-729-606-33	TRANSISTOR 2SC2603F			
Q702	8-729-180-93	TRANSISTOR 2SD809			
Q910	8-729-103-33	TRANSISTOR 2SD1310			
Q911	8-729-606-33	TRANSISTOR 2SC2603F			
Q915	8-729-103-48	TRANSISTOR 2SB1038			
Q916	8-729-117-54	TRANSISTOR 2SA1175			
Q920	8-729-180-93	TRANSISTOR 2SD809			
R011	1-247-775-00	CARBON	4.7	5%	1/6W
R012	1-247-863-00	CARBON	22K	5%	1/6W
R013	1-215-476-00	METAL	200K	1%	1/6W
R101	1-247-891-00	CARBON	330K	5%	1/6W
R102	1-247-831-00	CARBON	1K	5%	1/6W
R103	1-247-873-00	CARBON	56K	5%	1/6W
R104	1-247-831-00	CARBON	1K	5%	1/6W
R105	1-247-871-00	CARBON	47K	5%	1/6W
R106	1-247-901-00	CARBON	820K	5%	1/6W
R111	1-247-831-00	CARBON	1K	5%	1/6W
R115	1-247-891-00	CARBON	330K	5%	1/6W
R116	1-247-843-00	CARBON	3.3K	5%	1/6W
R117	1-247-831-00	CARBON	1K	5%	1/6W
R151	1-247-891-00	CARBON	330K	5%	1/6W
R152	1-247-831-00	CARBON	1K	5%	1/6W
R153	1-247-873-00	CARBON	56K	5%	1/6W
R154	1-247-831-00	CARBON	1K	5%	1/6W
R155	1-247-871-00	CARBON	47K	5%	1/6W
R156	1-247-901-00	CARBON	820K	5%	1/6W
R161	1-247-831-00	CARBON	1K	5%	1/6W
R165	1-247-891-00	CARBON	330K	5%	1/6W
R166	1-247-843-00	CARBON	3.3K	5%	1/6W
R167	1-247-831-00	CARBON	1K	5%	1/6W
R202	1-247-831-00	CARBON	1K	5%	1/6W
R203	1-247-831-00	CARBON	1K	5%	1/6W
R204	1-247-853-00	CARBON	8.2K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R205	1-247-831-00	CARBON	1K	5%	1/6W
R206	1-247-849-00	CARBON	5.6K	5%	1/6W
R207	1-247-891-00	CARBON	330K	5%	1/6W
R208	1-247-891-00	CARBON	330K	5%	1/6W
R209	1-247-891-00	CARBON	330K	5%	1/6W
R210	1-247-865-00	CARBON	27K	5%	1/6W
R211	1-247-849-00	CARBON	5.6K	5%	1/6W
R212	1-247-873-00	CARBON	56K	5%	1/6W
R214	1-247-847-00	CARBON	4.7K	5%	1/6W
R215	1-247-847-00	CARBON	4.7K	5%	1/6W
R218	1-247-875-00	CARBON	68K	5%	1/6W
R231	1-247-903-00	CARBON	1M	5%	1/6W
R252	1-247-831-00	CARBON	1K	5%	1/6W
R253	1-247-831-00	CARBON	1K	5%	1/6W
R254	1-247-853-00	CARBON	8.2K	5%	1/6W
R255	1-247-831-00	CARBON	1K	5%	1/6W
R256	1-247-849-00	CARBON	5.6K	5%	1/6W
R257	1-247-891-00	CARBON	330K	5%	1/6W
R258	1-247-891-00	CARBON	330K	5%	1/6W
R259	1-247-891-00	CARBON	330K	5%	1/6W
R260	1-247-865-00	CARBON	27K	5%	1/6W
R261	1-247-849-00	CARBON	5.6K	5%	1/6W
R262	1-247-873-00	CARBON	56K	5%	1/6W
R264	1-247-847-00	CARBON	4.7K	5%	1/6W
R265	1-247-847-00	CARBON	4.7K	5%	1/6W
R268	1-247-875-00	CARBON	68K	5%	1/6W
R281	1-247-903-00	CARBON	1M	5%	1/6W
R305	1-247-863-00	CARBON	22K	5%	1/6W
R306	1-247-863-00	CARBON	22K	5%	1/6W
R307	1-247-831-00	CARBON	1K	5%	1/6W
R308	1-247-847-00	CARBON	4.7K	5%	1/6W
R309	1-247-863-00	CARBON	22K	5%	1/6W
R310	1-247-873-00	CARBON	56K	5%	1/6W
R312	1-247-847-00	CARBON	4.7K	5%	1/6W
R313	1-247-855-00	CARBON	10K	5%	1/6W
R315	1-247-855-00	CARBON	10K	5%	1/6W
R316	1-247-855-00	CARBON	10K	5%	1/6W
R321	1-247-855-00	CARBON	10K	5%	1/6W
R322	1-247-855-00	CARBON	10K	5%	1/6W
R323	1-247-855-00	CARBON	10K	5%	1/6W
R331	1-247-879-00	CARBON	100K	5%	1/6W
R332	1-247-903-00	CARBON	1M	5%	1/6W
R333	1-247-843-00	CARBON	3.3K	5%	1/6W
R335	1-247-879-00	CARBON	100K	5%	1/6W
R336	1-247-879-00	CARBON	100K	5%	1/6W
R340	1-247-843-00	CARBON	3.3K	5%	1/6W
R341	1-247-843-00	CARBON	3.3K	5%	1/6W
R342	1-247-843-00	CARBON	3.3K	5%	1/6W
R343	1-247-843-00	CARBON	3.3K	5%	1/6W
R345	1-247-855-00	CARBON	10K	5%	1/6W
R346	1-247-855-00	CARBON	10K	5%	1/6W
R347	1-247-855-00	CARBON	10K	5%	1/6W
R348	1-247-855-00	CARBON	10K	5%	1/6W
R350	1-247-879-00	CARBON	100K	5%	1/6W
R351	1-247-855-00	CARBON	10K	5%	1/6W

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ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R352	1-247-855-00	CARBON	10K	5%	1/6W	
R353	1-247-855-00	CARBON	10K	5%	1/6W	
R354	1-247-855-00	CARBON	10K	5%	1/6W	
R355	1-247-855-00	CARBON	10K	5%	1/6W	
R356	1-247-879-00	CARBON	100K	5%	1/6W	
R357	1-247-891-00	CARBON	330K	5%	1/6W	
R358	1-247-879-00	CARBON	100K	5%	1/6W	
R361	1-247-855-00	CARBON	10K	5%	1/6W	
R362	1-247-855-00	CARBON	10K	5%	1/6W	
R363	1-247-855-00	CARBON	10K	5%	1/6W	
R371	1-247-855-00	CARBON	10K	5%	1/6W	
R372	1-247-855-00	CARBON	10K	5%	1/6W	
R373	1-247-855-00	CARBON	10K	5%	1/6W	
R380	1-247-855-00	CARBON	10K	5%	1/6W	
R381	1-247-847-00	CARBON	4.7K	5%	1/6W	
R382	1-247-873-00	CARBON	56K	5%	1/6W	
R383	1-247-879-00	CARBON	100K	5%	1/6W	
R385	1-247-855-00	CARBON	10K	5%	1/6W	
R386	1-247-847-00	CARBON	4.7K	5%	1/6W	
R394	1-247-831-00	CARBON	1K	5%	1/6W	
R395	1-247-855-00	CARBON	10K	5%	1/6W	
R396	1-247-855-00	CARBON	10K	5%	1/6W	
R397	1-247-855-00	CARBON	10K	5%	1/6W	
R398	1-247-855-00	CARBON	10K	5%	1/6W	
R399	1-247-855-00	CARBON	10K	5%	1/6W	
R411	1-247-847-00	CARBON	4.7K	5%	1/6W	
R412	1-247-871-00	CARBON	47K	5%	1/6W	
R413	1-247-847-00	CARBON	4.7K	5%	1/6W	
R420	1-247-192-00	(G-AEP)....CARBON	10	5%	1/2W	
R421	1-247-847-00	CARBON	4.7K	5%	1/6W	
R422	1-247-871-00	CARBON	47K	5%	1/6W	
R423	1-247-847-00	CARBON	4.7K	5%	1/6W	
R461	1-247-855-00	CARBON	10K	5%	1/6W	
R470	1-247-192-00	(G-AEP)....CARBON	10	5%	1/2W	
R501	1-247-855-00	CARBON	10K	5%	1/6W	
R502	1-247-825-00	CARBON	560	5%	1/6W	
R503	1-247-861-00	CARBON	18K	5%	1/6W	
R504	1-247-877-00	CARBON	82K	5%	1/6W	
R505	1-247-847-00	CARBON	4.7K	5%	1/6W	
R506	1-247-831-00	CARBON	1K	5%	1/6W	
R601	1-247-879-00	CARBON	100K	5%	1/6W	
R602	1-249-421-11	CARBON	2.2K	5%	1/6W	
R603	1-247-831-00	CARBON	1K	5%	1/6W	
R604	1-247-879-00	CARBON	100K	5%	1/6W	
R605 ⚠.	1-247-139-00	CARBON	2.2K	5%	1/4W	F
R606 ⚠.	1-247-139-00	CARBON	2.2K	5%	1/4W	F
R607 ⚠.	1-217-151-00	METAL PLATE	0.22	10%	2W	
R608	1-247-825-00	CARBON	560	5%	1/6W	
R609	1-247-825-00	CARBON	560	5%	1/6W	
R611 ⚠.	1-247-192-00	CARBON	10	5%	1/2W	F
R631 ⚠.	1-217-399-00	FUSIBLE	100	5%	1/4W	F
R632 ⚠.	1-247-240-00	CARBON	1K	5%	1/2W	F
R633 ⚠.	1-247-240-00	CARBON	1K	5%	1/2W	F
R634 ⚠.	1-217-399-00	FUSIBLE	100	5%	1/4W	F
R635 ⚠.	1-217-399-00	FUSIBLE	100	5%	1/4W	F
R651	1-247-879-00	CARBON	100K	5%	1/6W	
R652	1-249-421-11	CARBON	2.2K	5%	1/6W	
R653	1-247-831-00	CARBON	1K	5%	1/6W	
R654	1-247-879-00	CARBON	100K	5%	1/6W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R655	⚠.1-247-139-00	CARBON	2.2K	5%	1/4W	F
R656	⚠.1-247-139-00	CARBON	2.2K	5%	1/4W	F
R657	⚠.1-217-151-00	METAL PLATE	0.22	10%	2W	
R658	1-247-825-00	CARBON	560	5%	1/6W	
R659	1-247-825-00	CARBON	560	5%	1/6W	
R661	⚠.1-247-192-00	CARBON	10	5%	1/2W	F
R671	1-247-863-00	CARBON	22K	5%	1/6W	
R672	1-247-855-00	CARBON	10K	5%	1/6W	
R673	1-247-863-00	CARBON	22K	5%	1/6W	
R674	1-247-863-00	CARBON	22K	5%	1/6W	
R675	1-247-881-00	CARBON	120K	5%	1/6W	
R676	1-247-881-00	CARBON	120K	5%	1/6W	
R677	1-247-879-00	CARBON	100K	5%	1/6W	
R678	⚠.1-247-220-00	CARBON	150	5%	1/2W	F
R679	1-247-855-00	CARBON	10K	5%	1/6W	
R680	1-247-869-00	CARBON	39K	5%	1/6W	
R701	1-247-825-00	CARBON	560	5%	1/6W	
R702	1-247-847-00	CARBON	4.7K	5%	1/6W	
R703	1-247-867-00	CARBON	33K	5%	1/6W	
R704	1-247-833-00	CARBON	1.2K	5%	1/6W	
R705	1-247-835-00	CARBON	1.5K	5%	1/6W	
R711	1-247-847-00	CARBON	4.7K	5%	1/6W	
R712	1-247-875-00	CARBON	68K	5%	1/6W	
R721	1-247-847-00	CARBON	4.7K	5%	1/6W	
R722	1-247-875-00	CARBON	68K	5%	1/6W	
R731	1-247-847-00	CARBON	4.7K	5%	1/6W	
R732	1-247-875-00	CARBON	68K	5%	1/6W	
R741	1-247-847-00	CARBON	4.7K	5%	1/6W	
R742	1-247-875-00	CARBON	68K	5%	1/6W	
R751	1-247-847-00	CARBON	4.7K	5%	1/6W	
R752	1-247-875-00	CARBON	68K	5%	1/6W	
R761	1-247-847-00	CARBON	4.7K	5%	1/6W	
R762	1-247-875-00	CARBON	68K	5%	1/6W	
R771	1-247-847-00	CARBON	4.7K	5%	1/6W	
R772	1-247-875-00	CARBON	68K	5%	1/6W	
R781	1-247-815-00	CARBON	220	5%	1/6W	
R782	1-247-815-00	CARBON	220	5%	1/6W	
R783	1-247-815-00	CARBON	220	5%	1/6W	
R784	1-247-815-00	CARBON	220	5%	1/6W	
R785	1-247-815-00	CARBON	220	5%	1/6W	
R786	1-247-815-00	CARBON	220	5%	1/6W	
R787	1-247-831-00	CARBON	1K	5%	1/6W	
R791	1-247-135-00	CARBON	1.5K	5%	1/4W	
R792	1-247-135-00	CARBON	1.5K	5%	1/4W	
R793	1-247-825-00	CARBON	560	5%	1/6W	

ELECTRICAL PARTS

Ref.No.	Part No.	Description				
R796	1-247-831-00	CARBON	1K	5%	1/6W	
R797	1-247-855-00	CARBON	10K	5%	1/6W	
R798	1-247-855-00	CARBON	10K	5%	1/6W	
R799	1-247-855-00	CARBON	10K	5%	1/6W	
R801	⚠.1-247-127-00	CARBON	680	5%	1/4W	F
R802	⚠.1-247-127-00	CARBON	680	5%	1/4W	F
R903	⚠.1-217-422-00	FUSIBLE	1	5%	1/2W	F
R904	1-247-849-00	CARBON	5.6K	5%	1/6W	
R905	⚠.1-217-422-00	FUSIBLE	1	5%	1/2W	F
R906	⚠.1-217-482-00	FUSIBLE	12	5%	1W	F
R910	⚠.1-206-648-00	METAL OXIDE	220	5%	2W	F
R911	1-247-847-00	CARBON	4.7K	5%	1/6W	
R912	1-247-855-00	CARBON	10K	5%	1/6W	
R915	⚠.1-206-648-00	METAL OXIDE	220	5%	2W	F
R916	1-247-847-00	CARBON	4.7K	5%	1/6W	
R917	1-247-855-00	CARBON	10K	5%	1/6W	
R920	⚠.1-213-131-00	METAL OXIDE	100	5%	1W	F
R921	1-249-421-11	CARBON	2.2K	5%	1/6W	
RV401	1-230-360-11	RES, VAR, SLIDE 100K (BALANCE)				
RV402	1-230-361-11	RES, VAR, SLIDE 50K (MIC LEVEL)				
RV411	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 63Hz)				
RV412	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 150Hz)				
RV413	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 400Hz)				
RV414	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 1kHz)				
RV415	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 3kHz)				
RV416	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 6kHz)				
RV417	1-230-362-11	RES, VAR, SLIDE 250K/250K (G-EQ 14kHz)				
RY601	1-515-503-00	RELAY				
SW701	1-554-303-00	SWITCH, KEY BOARD (VOLUME UP)				
SW702	1-554-303-00	SWITCH, KEY BOARD (VOLUME DOWN)				
SW703	1-554-303-00	SWITCH, KEY BOARD (MUTING -20dB)				
SW704	1-554-303-00	SWITCH, KEY BOARD (PHONO)				
SW705	1-554-303-00	SWITCH, KEY BOARD (TUNER)				
SW706	1-554-303-00	SWITCH, KEY BOARD (CD/AUX)				
SW707	1-554-303-00	SWITCH, KEY BOARD (TAPE)				
SW1001	⚠.1-553-318-51	SWITCH, PUSH (AC POWER)(1 KEY)				
SW1002	⚠.1-526-576-51	(E)...SELECTOR, POWER WOLTAGE				
T1001	⚠.1-448-133-11	(E).......TRANSFORMER, POWER				
T1001	⚠.1-448-134-11	(AEP,UK)...TRANSFORMER, POWER				

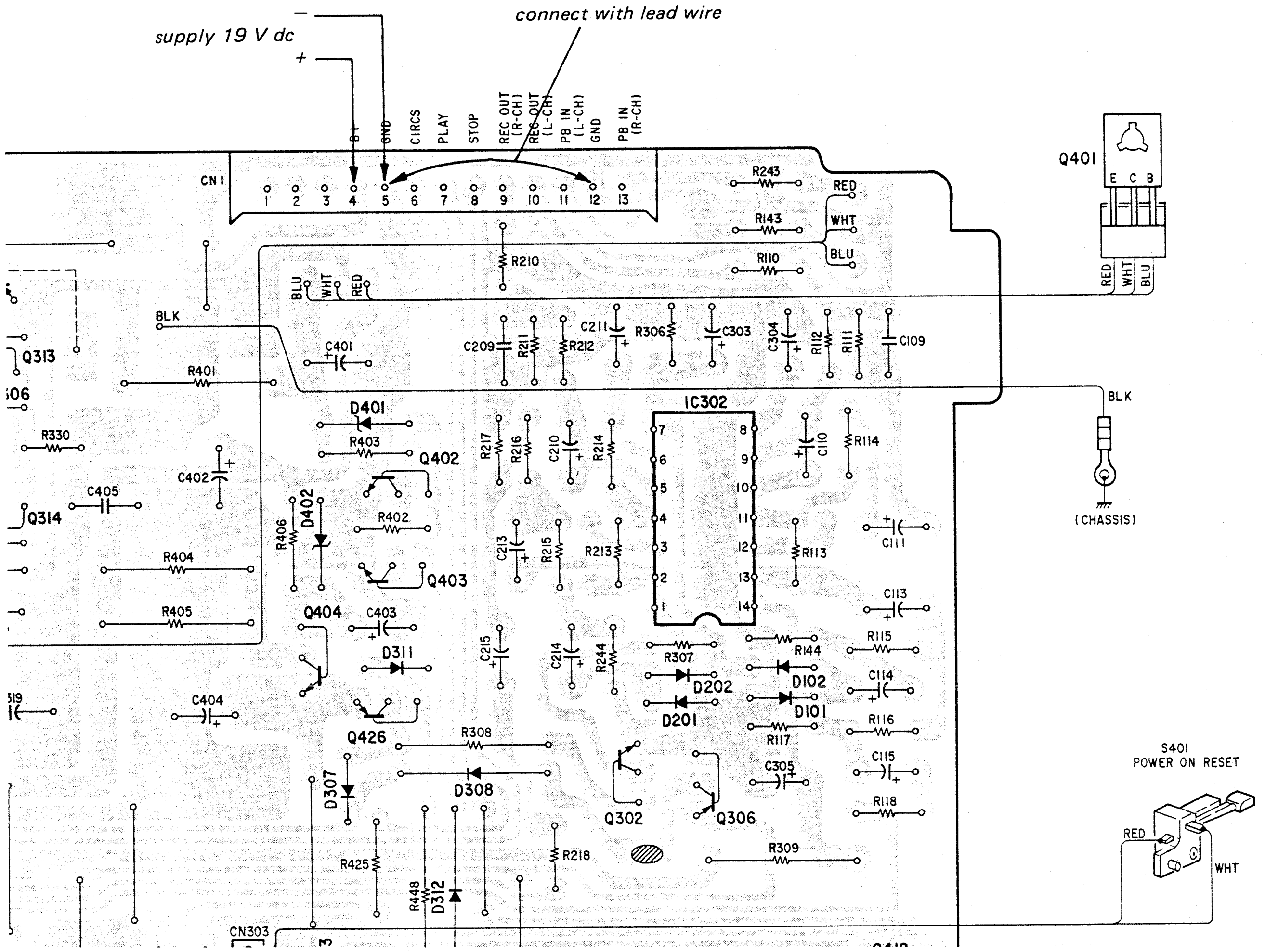
The components identified
by shading and mark ⚠ are
critical for safety.
Replace only with part
number specified.

STEREO CASSETTE DECK
〔TC-118/158R〕

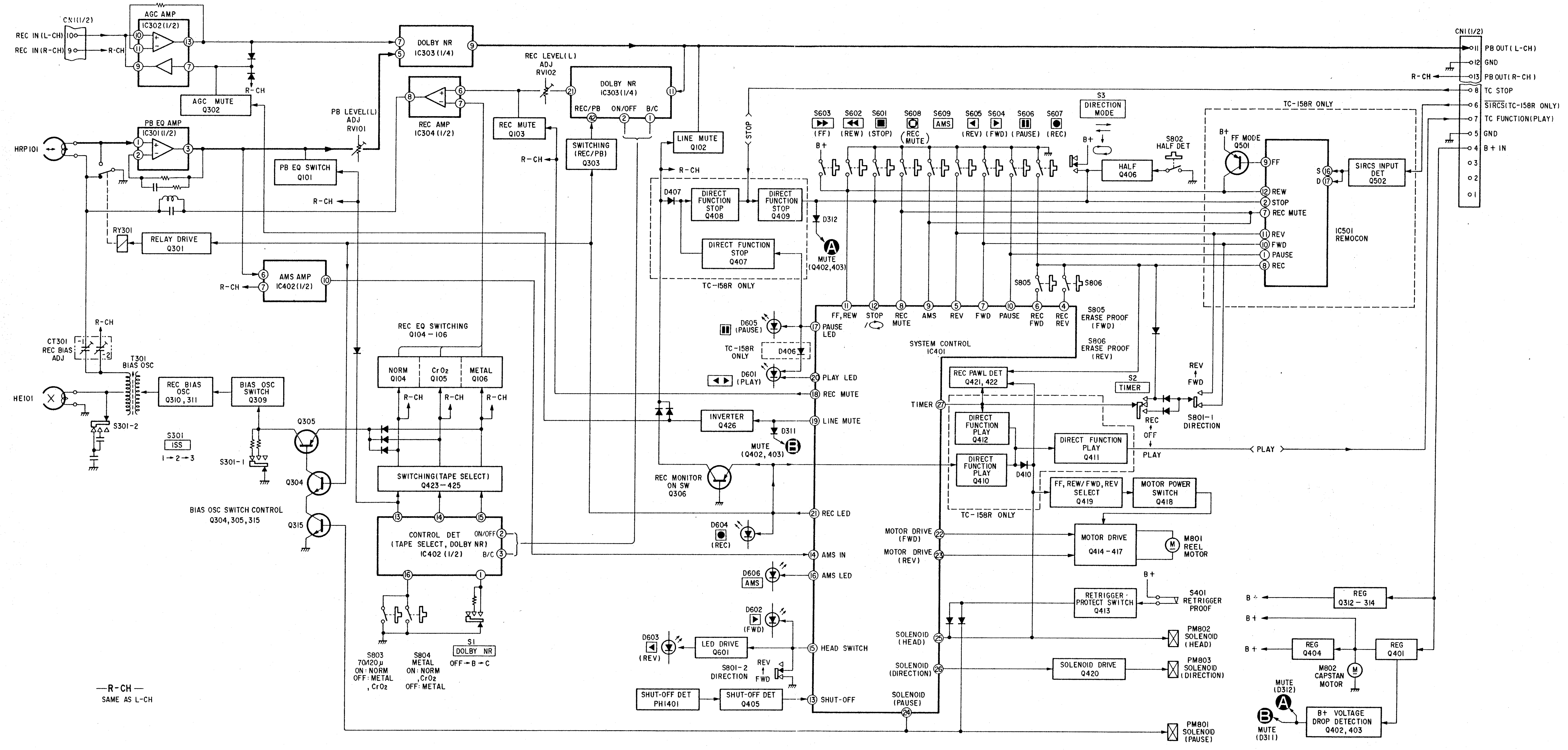
Tape Transport Mechanism Type	TCM-150R10

SERVICING NOTE

1. Voltage measurement should be made under the following condition.


supply 19 V dc
−
+
connect with lead wire
B+
GND
CIRCS
PLAY
STOP
REC OUT (R-CH)
REC OUT (L-CH)
PB IN (L-CH)
GND
PB IN (R-CH)
CN1
1 2 3 4 5 6 7 8 9 10 11 12 13
R243
R143
R110
RED
WHT
BLU
Q401
E C B
RED WHT BLU
R210
BLK
C401
R401
Q313
C209
R211
R212
C211
R306
C303
C304
R112
R111
C109
IC302
D401
R403
Q402
R217
R216
C210
R214
C110
R114
R330
C402
C405
Q314
D402
R406
R402
Q403
C213
R215
R213
R113
C111
R404
R405
Q404
C403
D311
C215
C214
R244
R307
R144
R115
C113
D202
D102
C114
D201
D101
R117
R116
C404
Q426
R308
D308
D307
Q302
Q306
C305
C115
R118
R425
R448
D312
R218
R309
CN303
(CHASSIS)
S401
POWER ON RESET

SECTION 1
BLOCK DIAGRAM


CN1(1/2)
REC IN(L-CH) 10
REC IN(R-CH) 9
R-CH
AGC AMP
IC302(1/2)
AGC MUTE
Q302
PB EQ AMP
IC301(1/2)
HRP101
PB EQ SWITCH
Q101
PB LEVEL(L)
ADJ
RV101
DOLBY NR
IC303(1/4)
REC AMP
IC304(1/2)
REC LEVEL(L)
ADJ
RV102
REC MUTE
Q103
DOLBY NR
IC303(1/4)
REC/PB
ON/OFF
B/C
SWITCHING
(REC/PB)
Q303
LINE MUTE
Q102
RY301
RELAY DRIVE
Q301
AMS AMP
IC402(1/2)
CT301
REC BIAS
ADJ
T301
BIAS OSC
HE101
REC BIAS
OSC
Q310, 311
BIAS OSC
SWITCH
Q309
S301-2
S301
ISS
1→2→3
S301-1
Q305
Q304
Q315
BIAS OSC SWITCH CONTROL
Q304,305,315
REC EQ SWITCHING
Q104 – 106
NORM
Q104
CrO2
Q105
METAL
Q106
SWITCHING(TAPE SELECT)
Q423 – 425
CONTROL DET
(TAPE SELECT, DOLBY NR)
IC402 (1/2)
ON/OFF
B/C
S803
70/120μ
ON: NORM
OFF: METAL
, CrO2
S804
METAL
ON: NORM
, CrO2
OFF: METAL
S1
DOLBY NR
OFF → B → C
—R-CH—
SAME AS L-CH
STOP
D407
DIRECT FUNCTION STOP Q408
DIRECT FUNCTION STOP Q409
DIRECT FUNCTION STOP Q407
TC-158R ONLY
D312
A
MUTE
(Q402,403)
S603 (FF)
S602 (REW)
S601 (STOP)
S608 (REC MUTE)
S609 AMS
S605 (REV)
S604 (FWD)
S606 (PAUSE)
S607 (REC)
B+
S3
DIRECTION
MODE
HALF
Q406
S802
HALF DET
FF, REW
STOP
REC MUTE
AMS
REV
FWD
PAUSE
REC FWD
REC REV
S805
S806
S805
ERASE PROOF
(FWD)
S806
ERASE PROOF
(REV)
SYSTEM CONTROL
IC401
D605
(PAUSE)
PAUSE LED
TC-158R
ONLY
D406
D601
(PLAY)
PLAY LED
REC MUTE
INVERTER
Q426
LINE MUTE
D311
MUTE
(Q402, 403)
B
REC MONITOR
ON SW
Q306
REC LED
D604
(REC)
AMS IN
D606
AMS
AMS LED
D602
(FWD)
D603
(REV)
LED DRIVE
Q601
HEAD SWITCH
S801-2
DIRECTION
REV
FWD
SHUT-OFF DET
PH1401
SHUT-OFF DET
Q405
SHUT-OFF
REC PAWL DET
Q421, 422
TIMER
DIRECT FUNCTION PLAY Q412
DIRECT FUNCTION PLAY Q410
D410
DIRECT FUNCTION PLAY Q411
S2
TIMER
REC
OFF
PLAY
REV
FWD
S801-1
DIRECTION
PLAY
FF, REW/FWD, REV
SELECT
Q419
MOTOR POWER
SWITCH
Q418
MOTOR DRIVE (FWD)
MOTOR DRIVE (REV)
MOTOR DRIVE
Q414 – 417
M801
REEL
MOTOR
RETRIGGER·
PROTECT SWITCH
Q413
S401
RETRIGGER
PROOF
SOLENOID (HEAD)
PM802
SOLENOID
(HEAD)
SOLENOID (DIRECTION)
SOLENOID DRIVE
Q420
PM803
SOLENOID
(DIRECTION)
SOLENOID (PAUSE)
PM801
SOLENOID
(PAUSE)
TC-158R ONLY
B+
FF MODE
Q501
FF
REW
STOP
REC MUTE
REV
FWD
PAUSE
REC
IC501
REMOCON
S
D
SIRCS INPUT
DET
Q502
CN1(1/2)
PB OUT(L-CH)
GND
PB OUT(R-CH)
TC STOP
SIRCS(TC-158R ONLY)
TC FUNCTION(PLAY)
GND
B+ IN
REG
Q312 – 314
REG
Q404
REG
Q401
M802
CAPSTAN
MOTOR
MUTE
(D312)
MUTE
(D311)
B+ VOLTAGE
DROP DETECTION
Q402, 403

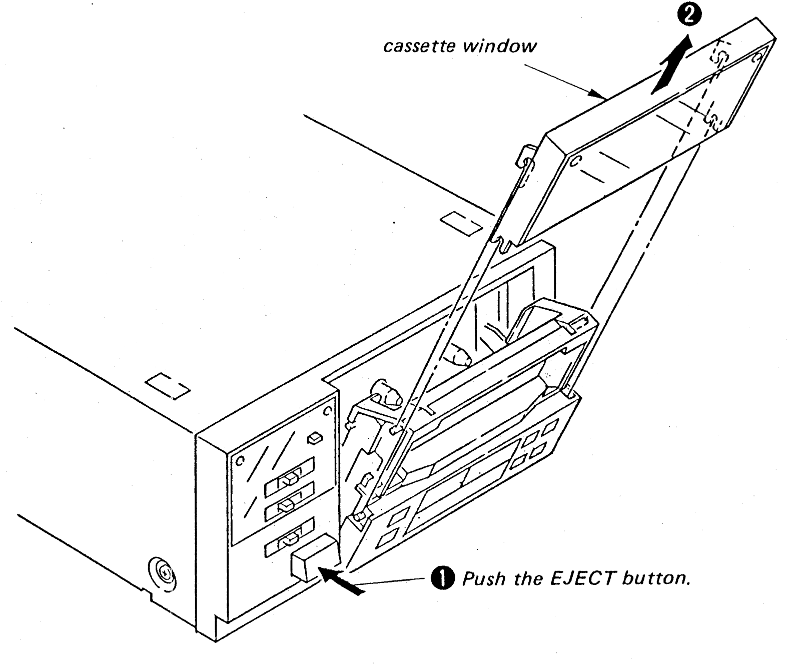
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

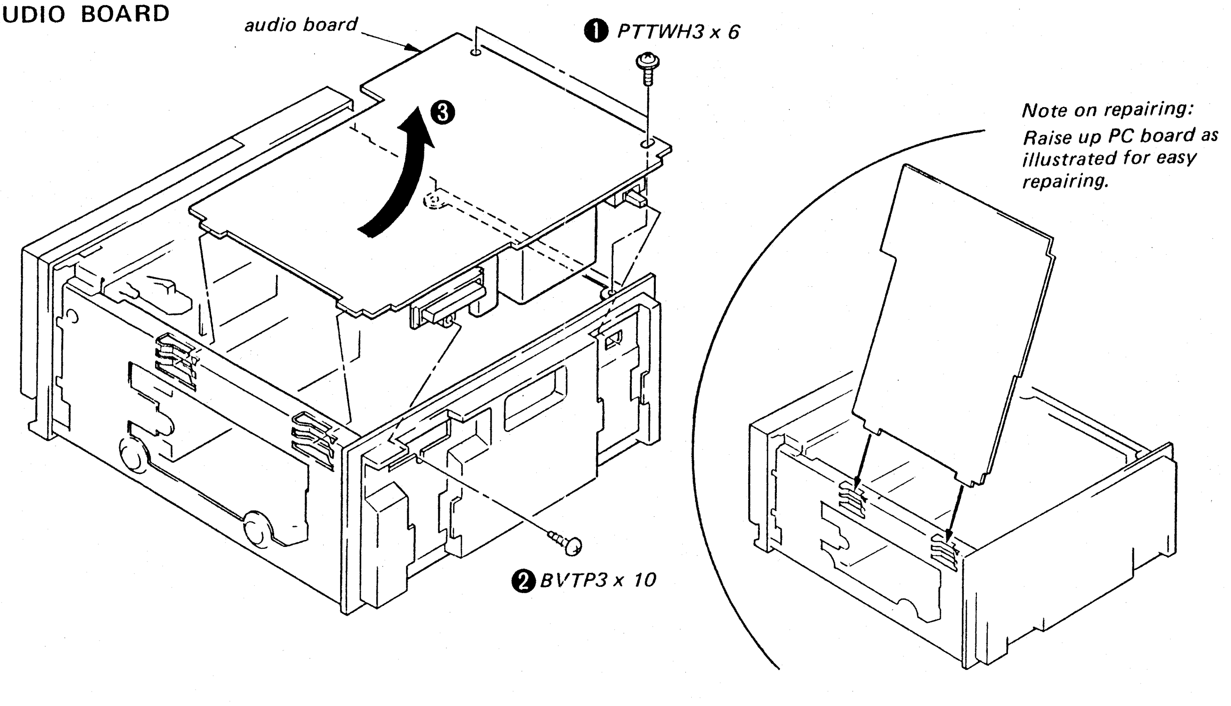
CASE REMOVAL

Remove case by taking out four screws securing case.

CASSETTE WINDOW

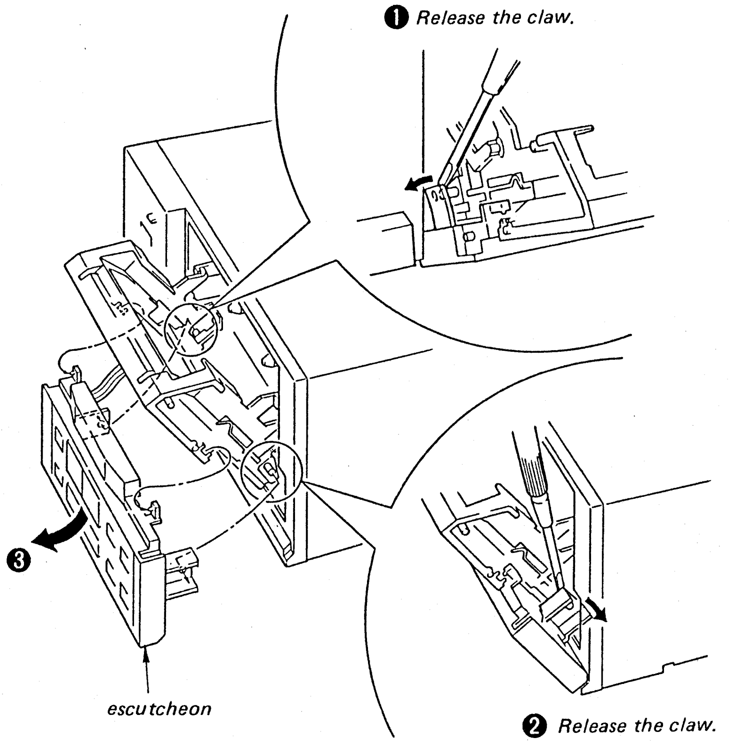

cassette window
❷
❶ Push the EJECT button.

AUDIO BOARD

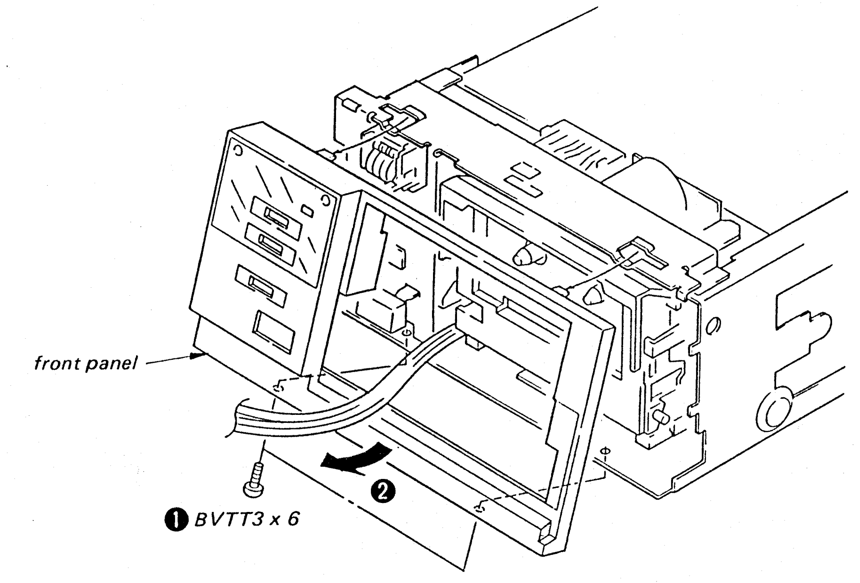

audio board
❶ PTTWH3 x 6
❸
❷ BVTP3 x 10

Note on repairing:
Raise up PC board as illustrated for easy repairing.

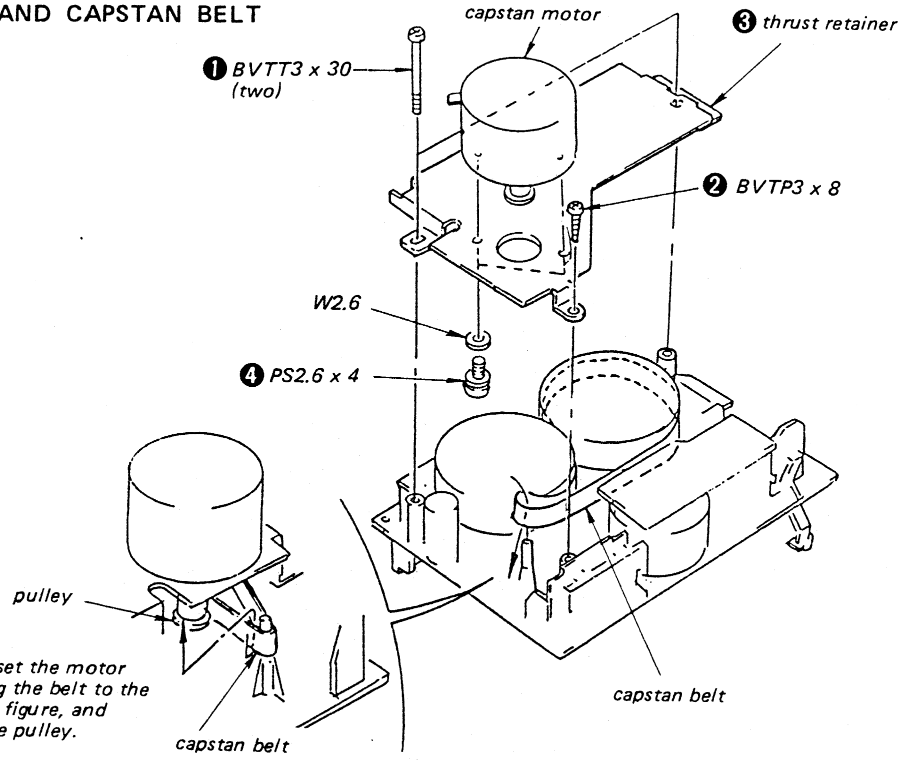
ESCUTCHEON


❶ Release the claw.
❸
escutcheon
❷ Release the claw.

FRONT PANEL

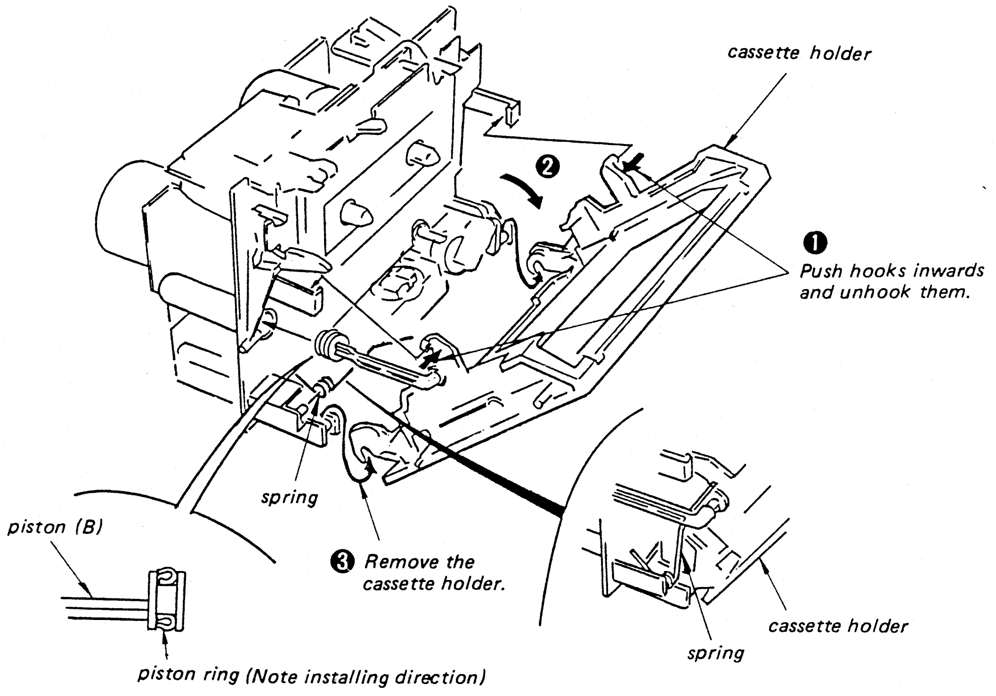

front panel
❷
❶ BVTT3 x 6

CAPSTAN MOTOR AND CAPSTAN BELT

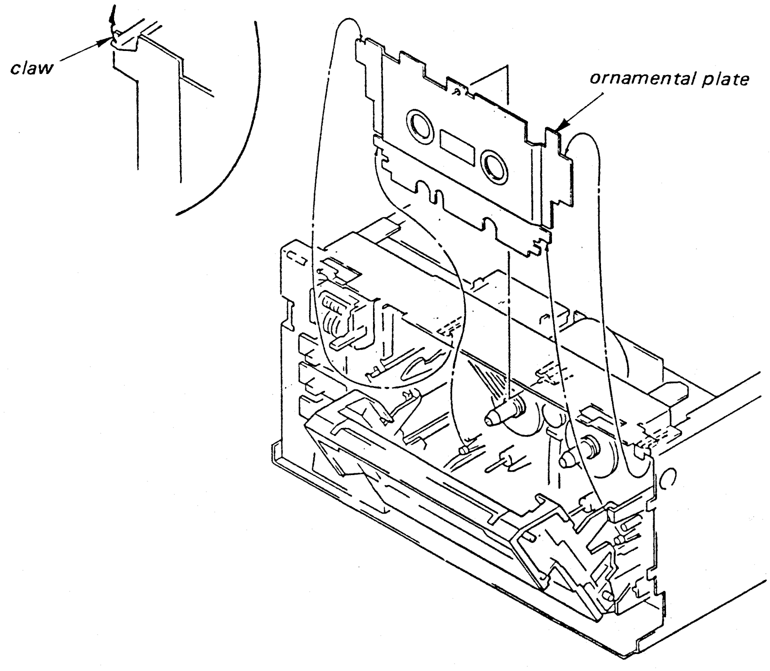

capstan motor
❸ thrust retainer
❶ BVTT3 x 30
(two)
❷ BVTP3 x 8
W2.6
❹ PS2.6 x 4
pulley
capstan belt
capstan belt

When reassembling, set the motor section after hooking the belt to the stud as shown in the figure, and then hook belt to the pulley.

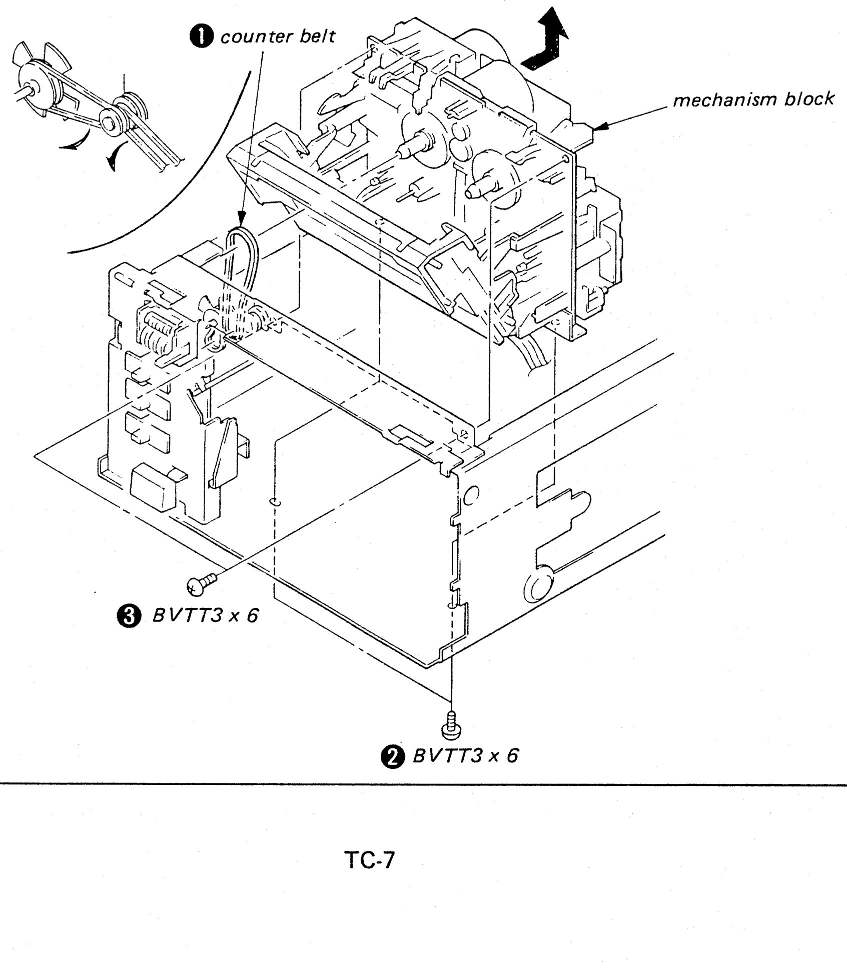
CASSETTE HOLDER


cassette holder
❷
❶
Push hooks inwards and unhook them.
spring
piston (B)
❸ Remove the cassette holder.
piston ring (Note installing direction)
cassette holder
spring

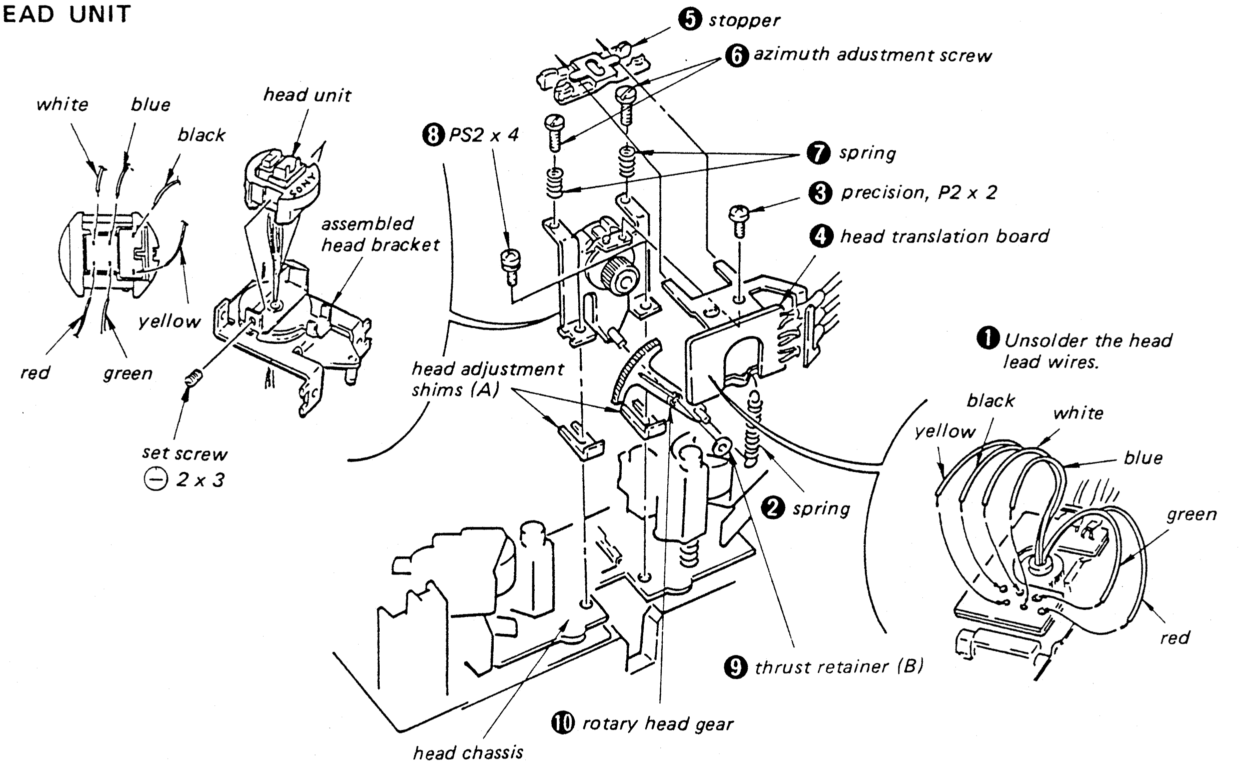
ORNAMENTAL PLATE


claw
ornamental plate

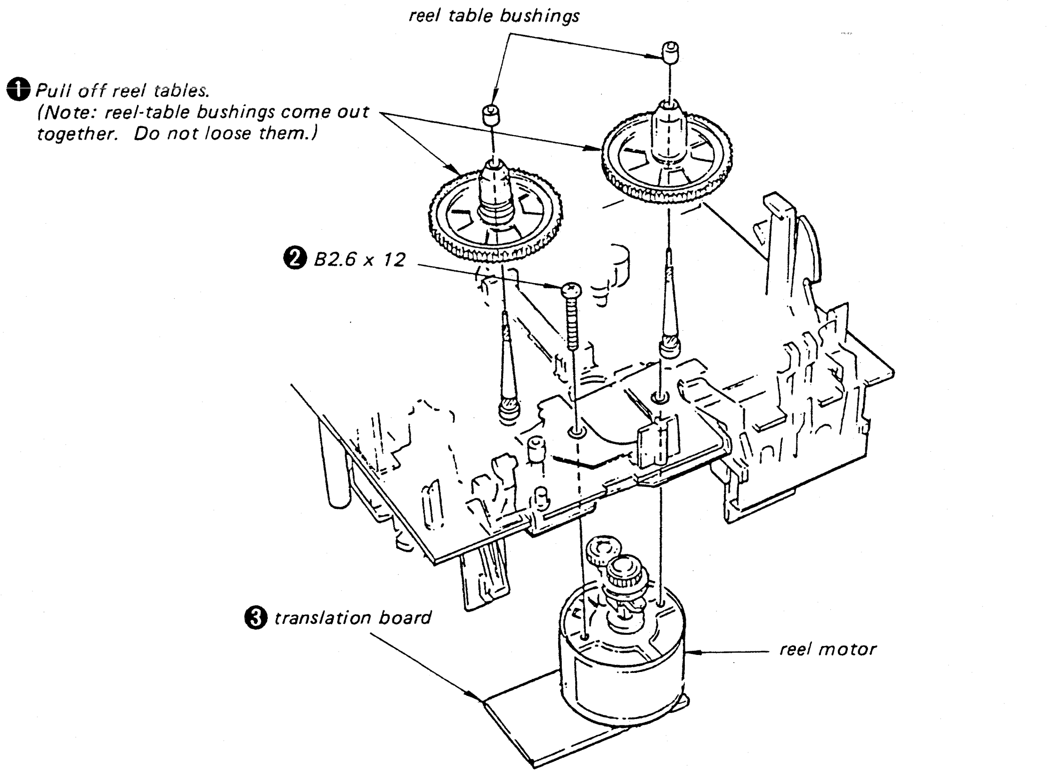
MECHANISM BLOCK AND COUNTER BELT


❶ counter belt
mechanism block
❸ BVTT3 x 6
❷ BVTT3 x 6

HEAD UNIT


❺ stopper
❻ azimuth adustment screw
white
blue
black
head unit
❽ PS2 x 4
❼ spring
❸ precision, P2 x 2
assembled
head bracket
❹ head translation board
yellow
red
green
head adjustment
shims (A)
❶ Unsolder the head
lead wires.
black
white
yellow
blue
set screw
⊖ 2 x 3
❷ spring
green
red
❾ thrust retainer (B)
❿ rotary head gear
head chassis

REEL MOTOR


reel table bushings
❶ Pull off reel tables.
(Note: reel-table bushings come out
together. Do not loose them.)
❷ B2.6 x 12
❸ translation board
reel motor

MEMO

SECTION 3
ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:
   - record/playback/erase head
   - rubber belts
   - capstan
   - pinch roller
2. Demagnetize the head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

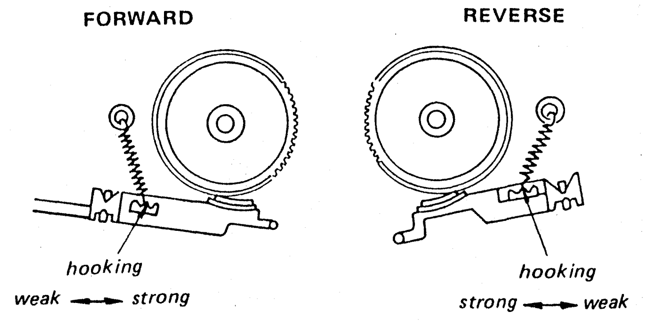
Torque	Torque meter	Meter reading
Forward	CQ-102C	28 – 60 g·cm (0.39 – 0.82 oz·inch)
Reverse	CQ-102RB	
Fast Forward and Rewind	CQ-201B	80 – 150 g·cm (1.1 – 2.07 oz·inch)
Forward Back Tension	CQ-102C	2.5 – 5.5 g·cm (0.03 – 0.07 oz·inch)
Reverse Back Tension	CQ-102RB	2.5 – 7 g·cm (0.03 – 0.09 oz·inch)

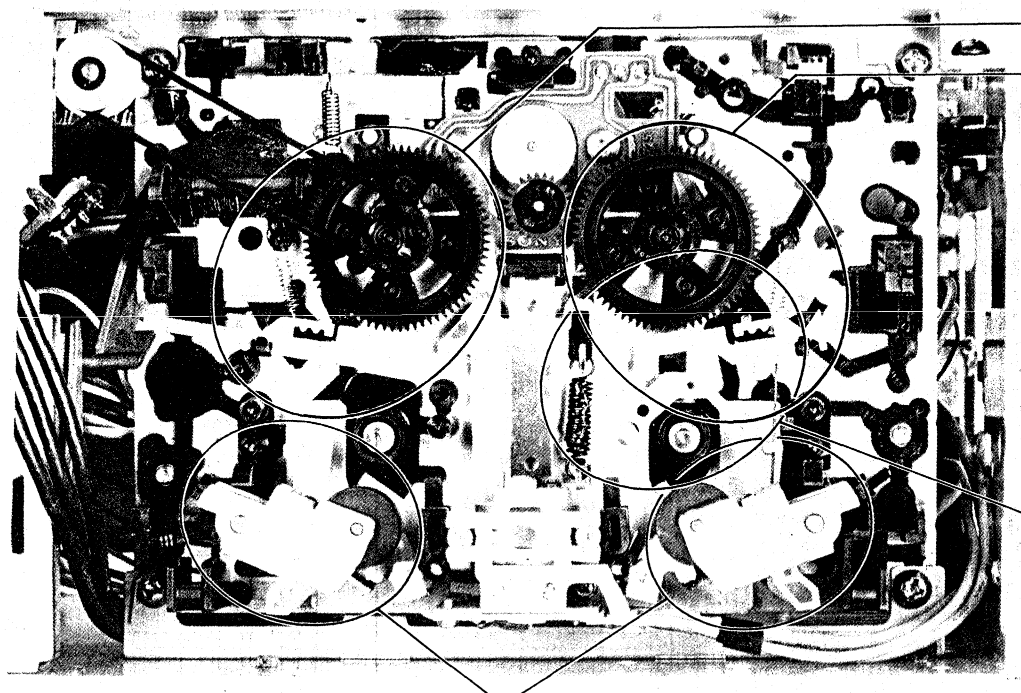
BACK TENSION ADJUSTMENT

– Forward and Reverse Playback Modes –

Forward: Torque Meter CQ-102C, Torque 2.5 – 5.5 g·cm (0.03 – 0.07 oz·inch)

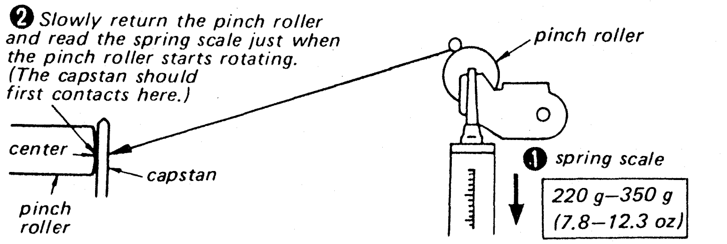
Reverse : Torque Meter CQ-102RB, Torque 2.5 – 7 g·cm (0.03 – 0.09 oz·inch)


FORWARD
REVERSE
hooking
weak ◄—► strong
hooking
strong ◄—► weak



Pinch Roller Pressure Measurement

– Playback Mode –

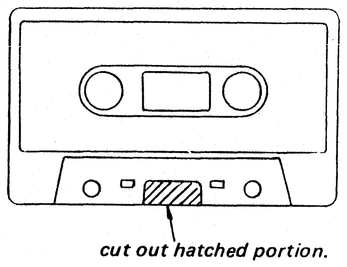


❷ *Slowly return the pinch roller and read the spring scale just when the pinch roller starts rotating. (The capstan should first contacts here.)*

pinch roller
center
capstan
pinch roller
❶ spring scale
220 g–350 g
(7.8–12.3 oz)

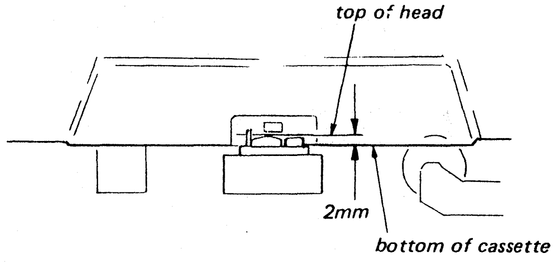
Head Position Adjustment in AMS mode

1. Prepare an adjustment cassette as shown below.

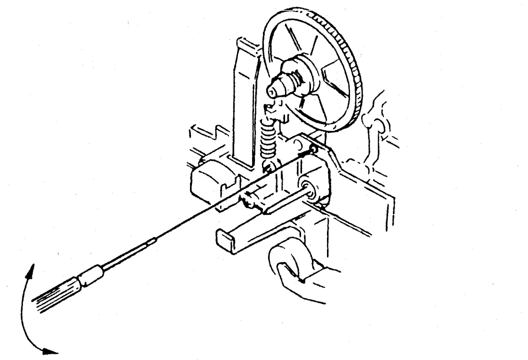


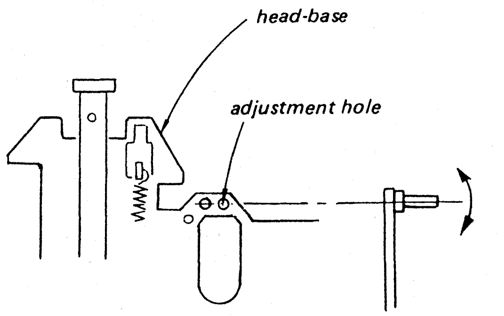
cut out hatched portion.

2. In AMS mode, comfirm that the the distance between top of head and bottom of cassette is 2 mm ±0.1 mm (3/32 inch).


top of head
2mm
bottom of cassette

If it is not, insert a small screwdriver to the adjustment hole and adjust the head position by bending a head-base so that the distance between top of head and bottom of cassette is 2 mm±0.1 mm.




head-base
adjustment hole

Precaution on Replacing

As the head center adjustment and the tape path adjustment are affected each other, do not perform them at the same time.

Note: When the record/playback/erase head is replaced, be sure to perform the preliminary adjustment first.

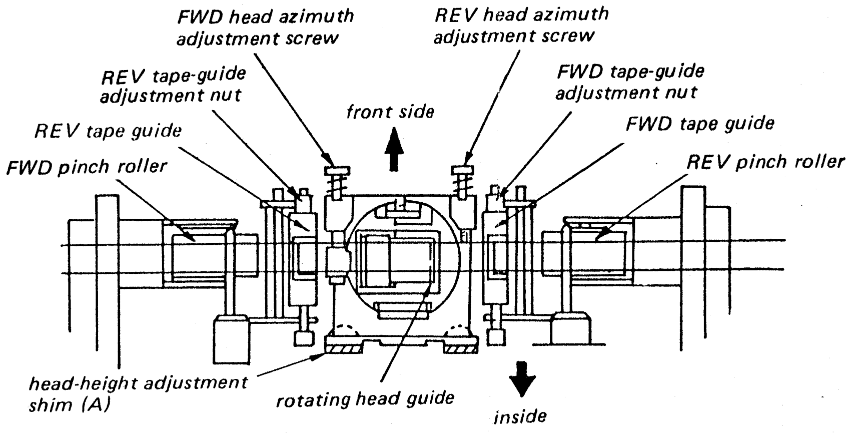
Head Center Adjustment

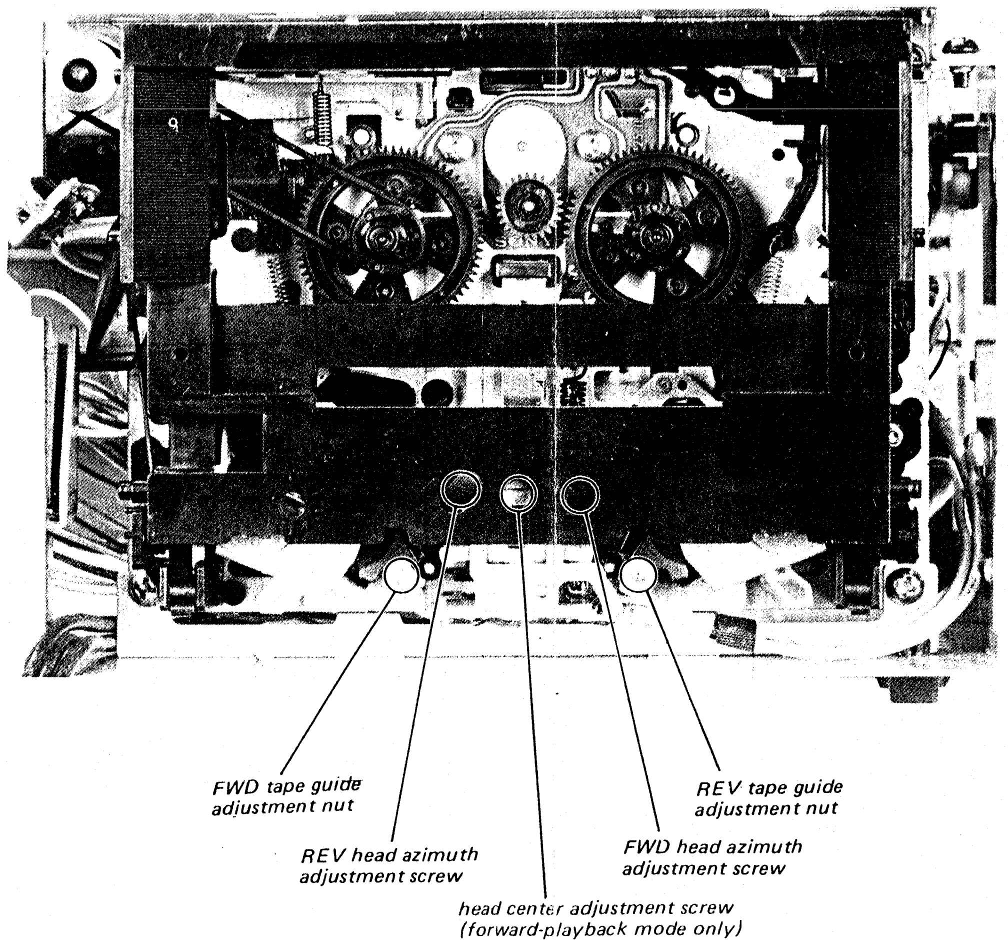
1. Insert a mirror tape cassette, CQ-009C or CQ-012C.
2. Place the unit in forward playback mode.
3. When the lower part of the tape is warped, loosen the head center adjustment screw. (Loosen the screw within one turn.)
4. Place the unit in reverse-playback mode.
5. When the upper part of the tape is warped, secure the adjustment screw. (Secure the screw within one turn.)
6. Repeat steps 2 to 5 several times until there is no warp both in forward and reverse mode.
7. If the warp is not disappeared, repeat steps 2 to 6 after adding or removing the head height adjustment shim (A).
8. After adjustment, lock the head center adjustment screw with locking compound.

Tape Path Adjustment

1. Clean the pinch roller and the record/playback/erase head with soft cloth moistened with alcohol.
2. Mode: playback
   Refer to step 1 of the Record/playback Head Azimuth Adjustment on page TC-16 for the setup.
3. Adjust the FWD azimuth adjustment screw in the forward-playback mode and the REV azimuth adjustment screw in the reverse-playback mode so that the oscilloscope reads the maximum output and lissajous figure is in 30 angle reading on the oscilloscope across the LINE OUT.
4. Adjust the FWD tape-guide nut in the foward-playback mode and the REV tape-guide nut in the reverse-playback mode for an in-phase lissajous pattern.
   The turning amount of the nuts should be within 3/4 turns.
5. Repeat steps 3 and 4 serveral times until no improvement is obtained.
6. Play a mirror tape cassette in the forward-playback mode.
7. Confirm there is no tape curl at the tape guide.

Note: After these adjustments, be sure to perform the Record/playback Head Azimuth Adjustment on page TC-16.


FWD head azimuth adjustment screw
REV head azimuth adjustment screw
REV tape-guide adjustment nut
FWD tape-guide adjustment nut
front side
REV tape guide
FWD tape guide
FWD pinch roller
REV pinch roller
head-height adjustment shim (A)
rotating head guide
inside

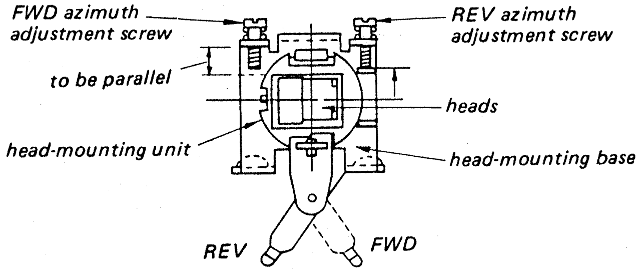

FWD tape guide adjustment nut
REV tape guide adjustment nut
REV head azimuth adjustment screw
FWD head azimuth adjustment screw
head center adjustment screw (forward-playback mode only)

HEAD UNIT ADJUSTMENT WHEN REPLACED

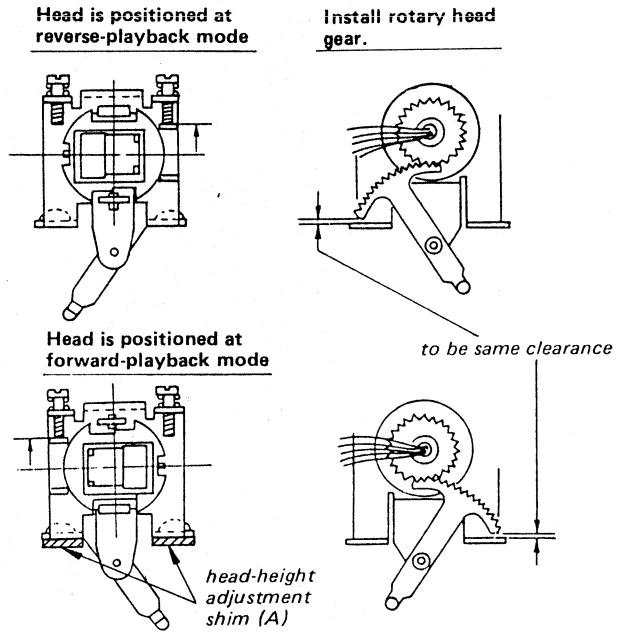
Perform the following preliminary adjustments before proceeding to the Head Center and Tape Path Adjustments.

Preliminary Adjustment

1. Install head-mounting unit on the head-mounting base by threading head lead wires through the round hole in the head-mounting base. Also refer to page TC-9.
2. By adjusting both head-azimuth adjustment screws in both forward-playback and reverse-playback mode head positions, align the head-compartment edge line in parallel with the edge line of the head-mounting unit at the azimuth adjustment screws. (visual adjustment)


FWD azimuth adjustment screw
REV azimuth adjustment screw
to be parallel
heads
head-mounting unit
head-mounting base
REV
FWD

Be sure to orient the rotary-head gear as shown below.


Head is positioned at reverse-playback mode
Install rotary head gear.
Head is positioned at forward-playback mode
to be same clearance
head-height adjustment shim (A)

3. Reassemble the head assembly, head translation board, head-height adjustment shims (A), etc, in the reverse manner of disassembly on page TC-9.
4. Perform the Head-Center and Tape-Path Adjustments on pages TC-13 and TC-14.
5. Perform the Head-Azimuth Adjustment on page TC-16.

3-2. ELECTRICAL ADJUSTMENTS

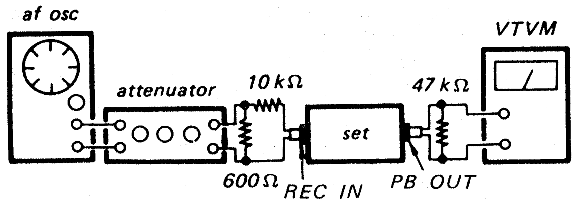
Note: The adjustment should be performed in the order given in this service manual.
The adjustments should be performed for both L-CH and R-CH.

- Switches and controls should be set as follows unless otherwise specified.

DOLBY NR switch:	OFF
TIMER switch:	OFF
ISS switch:	2

- Standard Record:
  Deliver the standard input signal level to the input jack and control the attenuator to obtain the standard output signal level.

– Record Mode –


af osc
VTVM
attenuator
10 kΩ
47 kΩ
set
600 Ω
REC IN
PB OUT

Standard Input Level

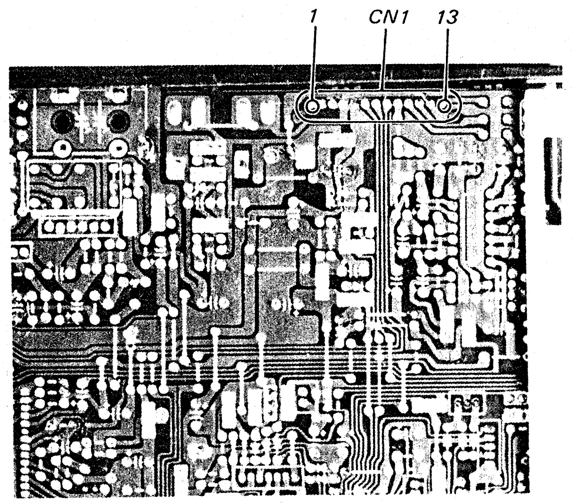
	REC IN
source impedance	10 kΩ
input level	0.44 V (–5 dB)

Standard Output Level

	PB OUT
load impedance	47 kΩ
output level	0.44 V (–5 dB)

Locations of REC IN and PB OUT

	CN1 terminal No.		
	L-CH	R-CH	GND
REC IN	10	9	12
PB OUT	11	13	12

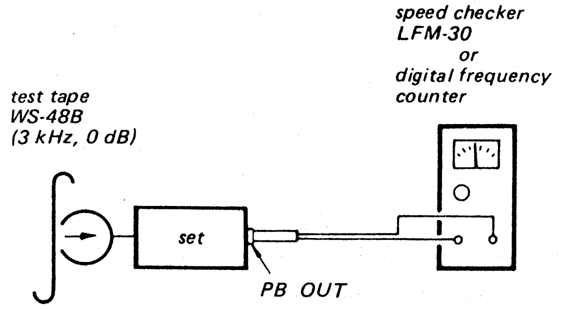


Tape Speed Adjustment

Procedure:

See the left for locations of REC IN and PB OUT.

Mode: forward-playback


speed checker
LFM-30
or
digital frequency
counter
test tape
WS-48B
(3 kHz, 0 dB)
set
PB OUT

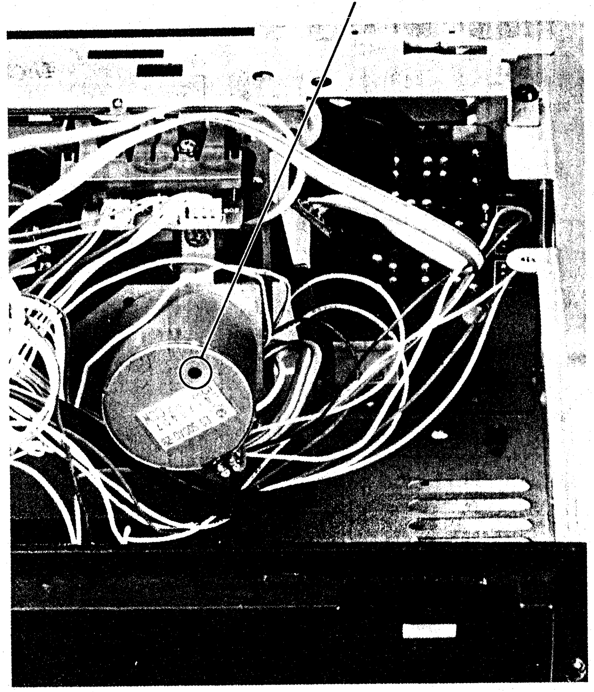
Specification:

Speed checker	Digital frequency counter
–1 ~ +1 %	2,970 Hz to 3,030 Hz

Frequency difference between the beginning and the end of the tape should be within 0.8% (25Hz).

Adjustment Location: Motor (M802)

Built-in adjustable resistor
(Adjust the speed by using screwdriver. When turning the screw clockwise, speed is faster.)

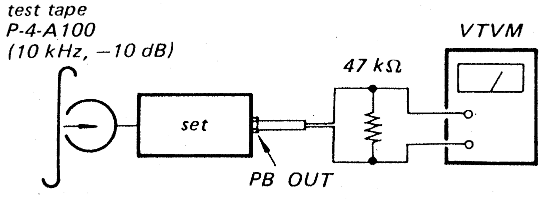


Record/playback Head Azimuth Adjustment

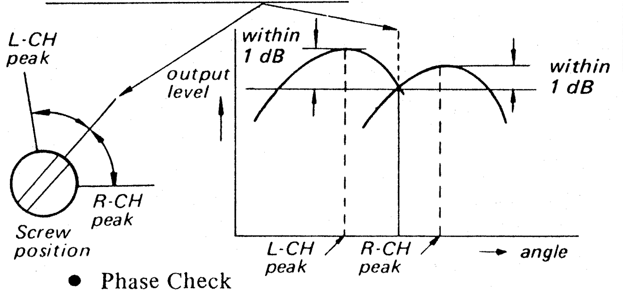
Procedure:

See page TC-15 for locations of REC IN and PB OUT.

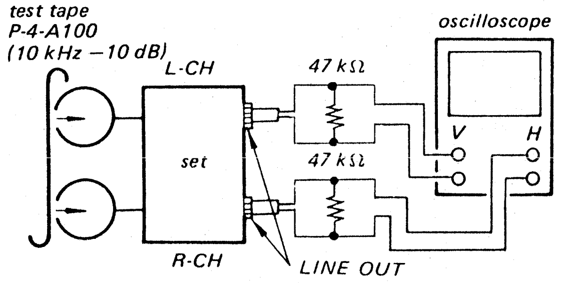
1. Mode: forward-playback

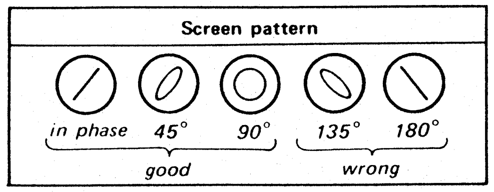

test tape
P-4-A100
(10 kHz, –10 dB)
VTVM
47 kΩ
set
PB OUT

2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screws until both of output levels match together within 1 dB.


L-CH
peak
within
1 dB
output
level
within
1 dB
R-CH
peak
Screw
position
L-CH
peak
R-CH
peak
angle

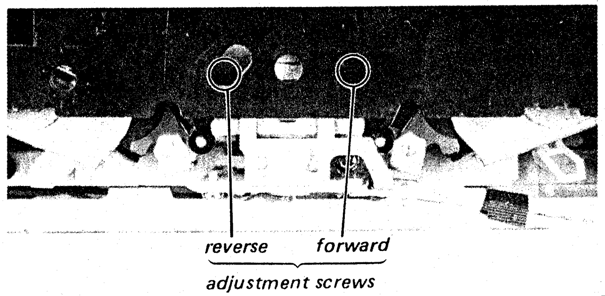
- Phase Check


test tape
P-4-A100
(10 kHz –10 dB)
L-CH
47 kΩ
oscilloscope
V
H
set
47 kΩ
R-CH
LINE OUT


Screen pattern
in phase
45°
90°
135°
180°
good
wrong

3. Set in the reverse-playback mode and repeat the steps 1 – 2.
4. After the adjustment, lock the screws with locking compound.

Adjustment Location:

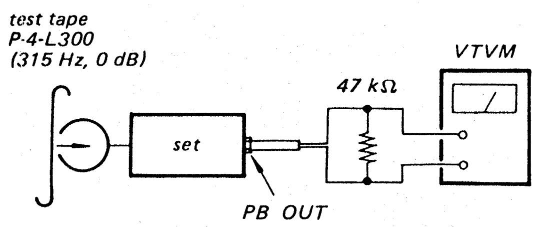

reverse
forward
adjustment screws

Playback Level Adjustment

Procedure:

See page TC-15 for locations of REC IN and PB OUT.

Mode: playback


test tape
P-4-L300
(315 Hz, 0 dB)
VTVM
47 kΩ
set
PB OUT

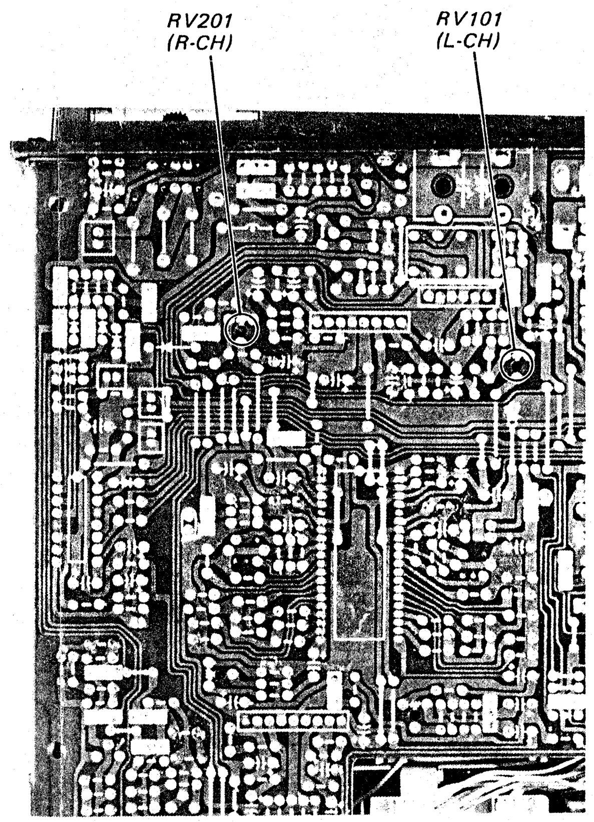
Adjust the RV101 (L-CH) and RV201 (R-CH) so that the specification is met.

Specification:

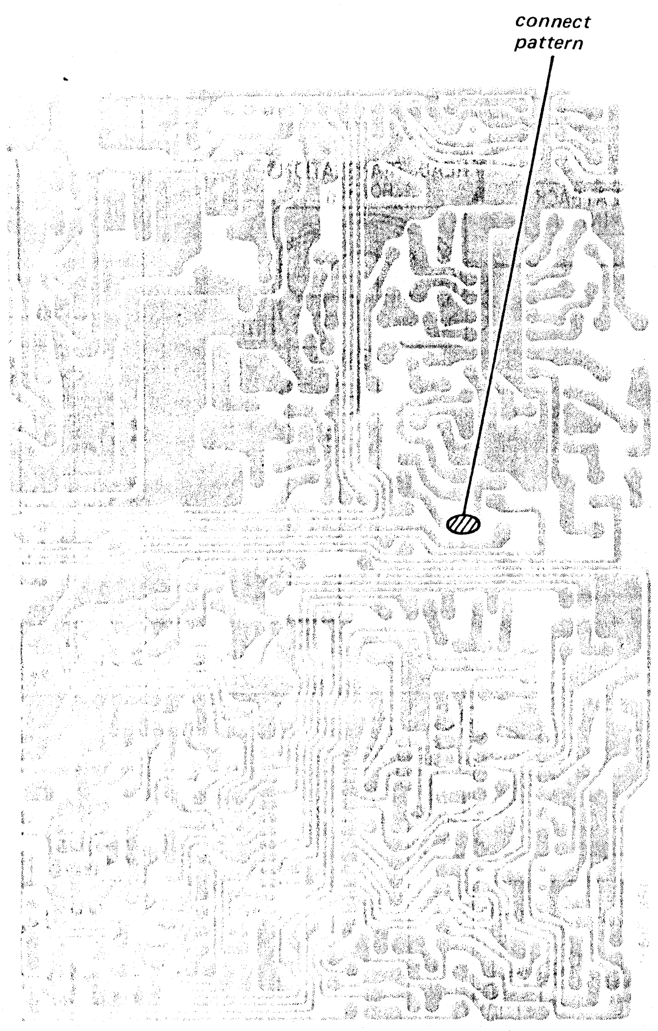
PB OUT level: 0.41 to 0.46 V
(–5.5 to –4.5 dB)
Level difference between channels:
less than 0.5 dB

Check that the PB OUT level does not change in playback mode while changing the mode from playback to stop several times.

Adjustment Location: audio board


RV201
(R-CH)
RV101
(L-CH)

Note: Before performing Record Bias/Record Level Adjustment, connect pattern.


connect
pattern

Record Bias Adjustment

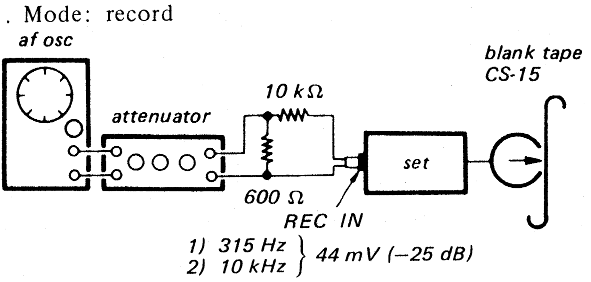
Setting:

ATTENUATOR: standard record
(See page TC-15.)

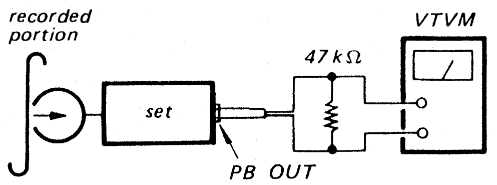
Procedure:

See page TC-15 for locations of REC IN and PB OUT.

1. Mode: record


af osc
attenuator
10 kΩ
600 Ω
set
REC IN
blank tape
CS-15
1) 315 Hz
2) 10 kHz
44 mV (−25 dB)

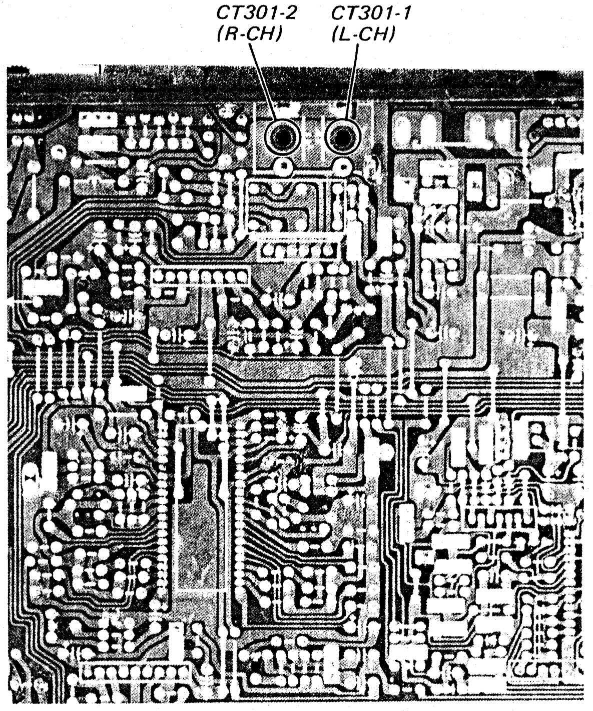
2. Mode: playback


recorded
portion
set
PB OUT
47 kΩ
VTVM

Confirm that the 10 kHz playback output is 0 dB relative to the 315 Hz output. If necessary, adjust CT301-1 (L-CH), CT301-2 (R-CH) and repeat the steps given above.

3. After adjustment, disconnect pattern.

Adjustment Location: audio board


CT301-2
(R-CH)
CT301-1
(L-CH)

Record Level Adjustment

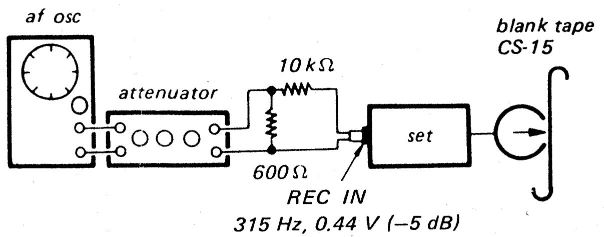
Setting:

ATTENUATOR: standard record
(See page TC-15.)

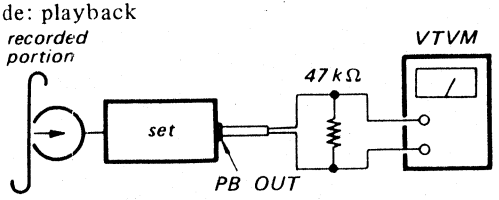
Procedure:

See page TC-15 for locations of REC IN and PB OUT.

1. Mode: record


af osc
attenuator
10 kΩ
600 Ω
set
REC IN
blank tape
CS-15
315 Hz, 0.44 V (−5 dB)

2. Mode: playback


recorded
portion
set
PB OUT
47 kΩ
VTVM

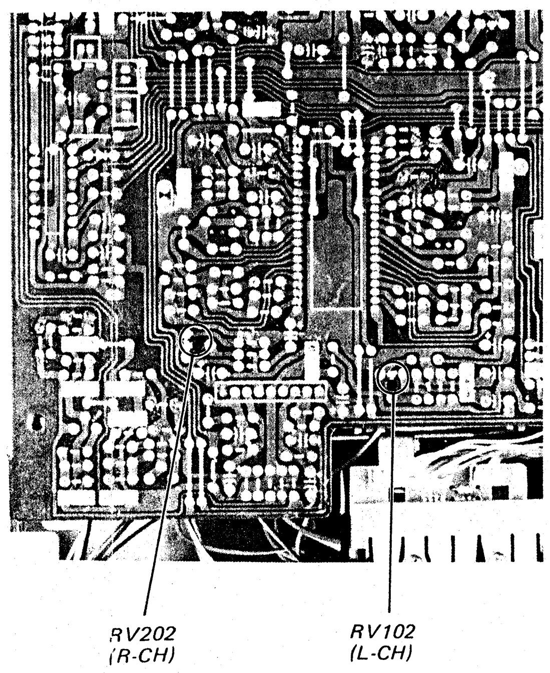
3. Play back the signal recorded in step 1. Confirm that the signal level is within the specification below. If necessary, adjust RV102 (L-CH), RV202 (R-CH) and repeat the steps 1 – 3.

Specification:

PB OUT level: 0.41 to 0.46 V
(−5.5 to −4.5 dB)

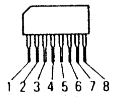
4. After adjustment, disconnect pattern.

Adjustment Location: audio board

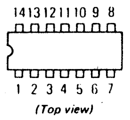

RV202
(R-CH)
RV102
(L-CH)

• Semiconductor Lead Layouts

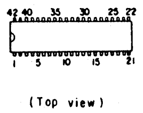
LA3160



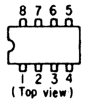
LA3220


14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)

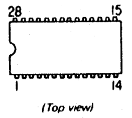
CX20187


42 40 35 30 25 22
1 5 10 15 21
(Top view)

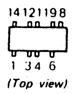
NJM4558S


8 7 6 5
1 2 3 4
(Top view)

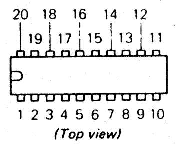
TC9312N-001


28 15
1 14
(Top view)

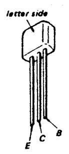
CX10034


14 12 11 9 8
1 3 4 6
(Top view)

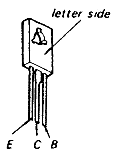
M50761-417P


20 18 16 14 12
19 17 15 13 11
1 2 3 4 5 6 7 8 9 10
(Top view)

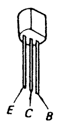
2SA1175
2SD1020


letter side
E
C
B

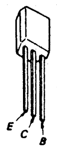
2SB548-R
2SD809-K


letter side
E C B

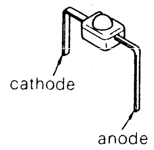
2SB1013
2SD1387



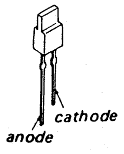
2SC2603-F
DTA114ES
DTA144ES
DTC144ES



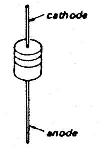
GL-1EG102
GL-1HY102
GL-1PR102


cathode
anode

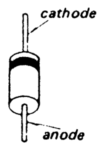
GL-8PG1


cathode
anode

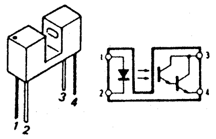
1SS202-1


cathode
anode

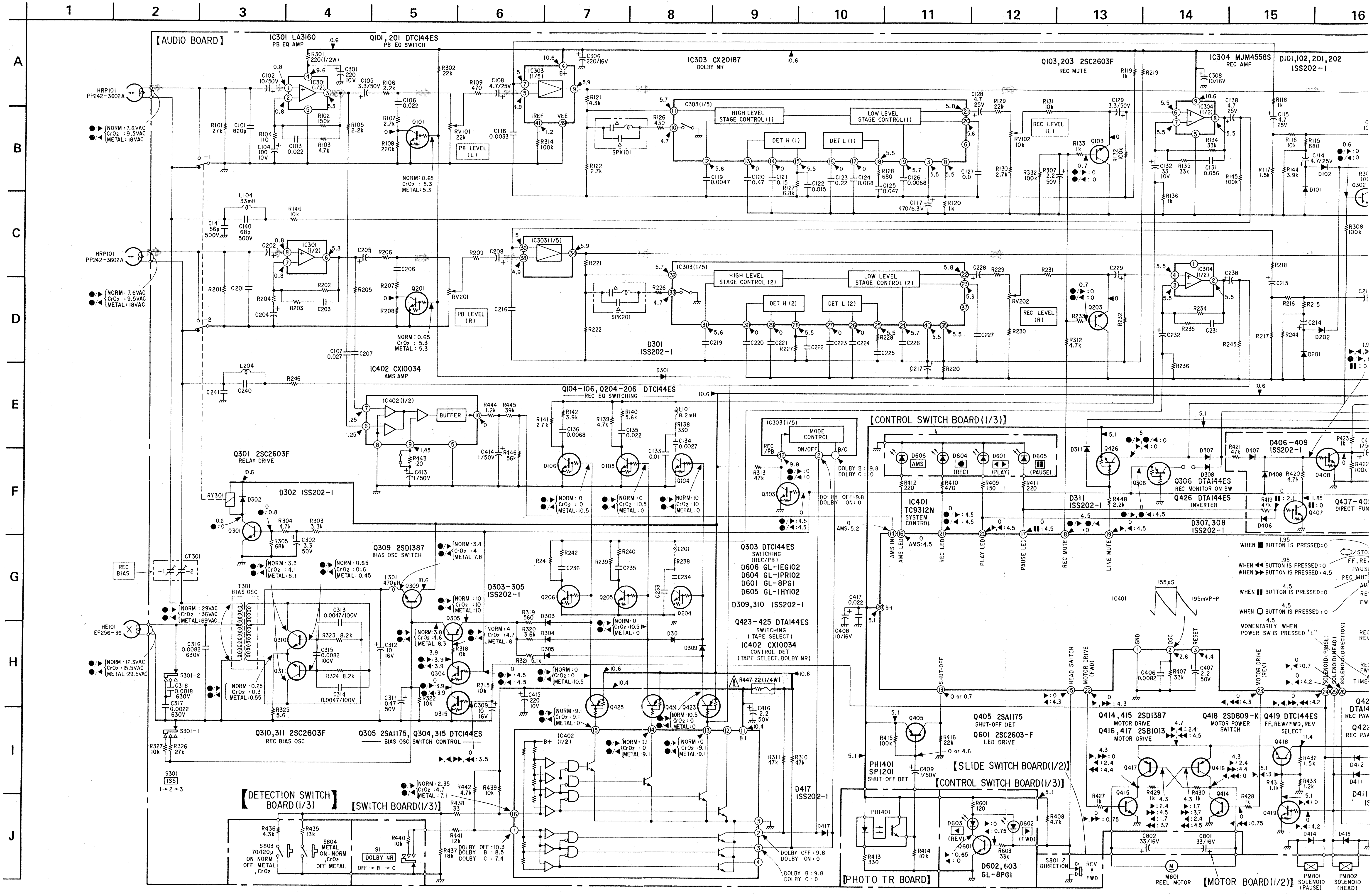
HZ11A1L
HZ11B2L
HZ6B1L


cathode
anode

SPI201-20



4-2. SCHEMATIC DIAGRAM


1
2
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4
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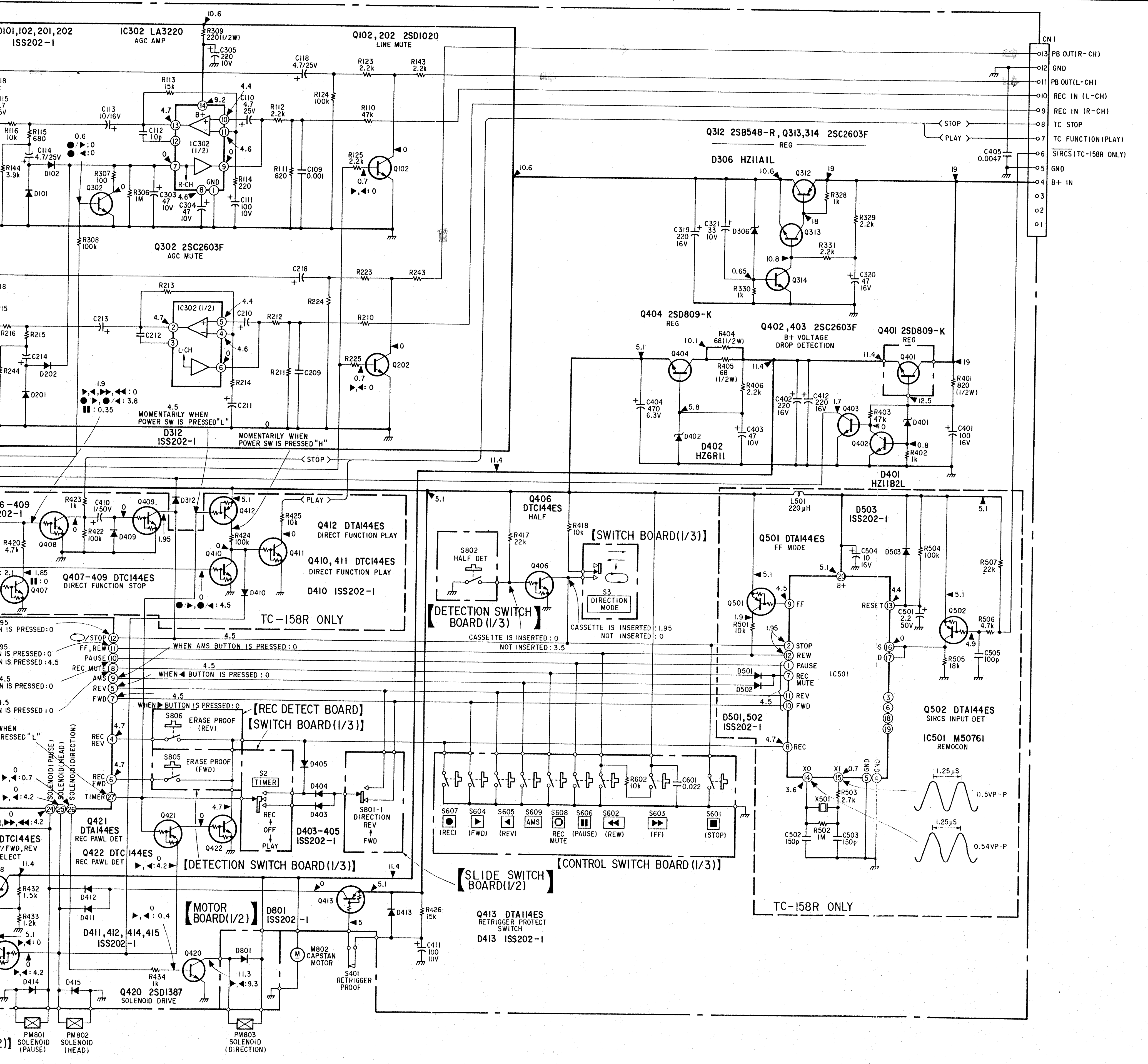
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
[AUDIO BOARD]
IC301 LA3160 PB EQ AMP
Q101, 201 DTC144ES PB EQ SWITCH
IC303 CX20187 DOLBY NR
Q103, 203 2SC2603F REC MUTE
IC304 MJM4558S REC AMP
D101, 102, 201, 202 1SS202-1
HRP101 PP242-3602A
NORM : 7.6VAC CrO2 : 9.5VAC METAL : 18VAC
PB LEVEL (L)
PB LEVEL (R)
HIGH LEVEL STAGE CONTROL (1)
LOW LEVEL STAGE CONTROL (1)
HIGH LEVEL STAGE CONTROL (2)
LOW LEVEL STAGE CONTROL (2)
DET H (1)
DET L (1)
DET H (2)
DET L (2)
REC LEVEL (L)
REC LEVEL (R)
SPK101
SPK201
D301 1SS202-1
IC402 CX10034 AMS AMP
BUFFER
Q104-106, Q204-206 DTC144ES REC EQ SWITCHING
Q301 2SC2603F RELAY DRIVE
RY301
D302 1SS202-1
Q309 2SD1387 BIAS OSC SWITCH
D303-305 1SS202-1
T301 BIAS OSC
CT301
REC BIAS
HE101 EF256-36
NORM : 29VAC CrO2 : 36VAC METAL : 69VAC
NORM : 12.3VAC CrO2 : 15.5VAC METAL : 29.5VAC
Q310, 311 2SC2603F REC BIAS OSC
Q305 2SA1175, Q304, 315 DTC144ES BIAS OSC SWITCH CONTROL
S301 1SS 1→2→3
Q303 DTC144ES SWITCHING (REC/PB)
D606 GL-1EG102
D604 GL-1PR102
D601 GL-8PG1
D605 GL-1HY102
D309, 310 1SS202-1
Q423-425 DTA144ES SWITCHING (TAPE SELECT)
IC402 CX10034 CONTROL DET (TAPE SELECT, DOLBY NR)
IC303(1/5) MODE CONTROL ON/OFF B/C REC/PB
DOLBY B : 9.8 DOLBY C : 0
DOLBY OFF : 9.8 DOLBY ON : 0
[DETECTION SWITCH BOARD (1/3)]
[SWITCH BOARD (1/3)]
S803 70/120μ ON : NORM OFF : METAL, CrO2
S804 METAL ON : NORM, CrO2 OFF : METAL
S1 DOLBY NR OFF → B → C
DOLBY OFF : 10.3 DOLBY B : 8.5 DOLBY C : 7.4
[CONTROL SWITCH BOARD (1/3)]
D606 AMS
D604 (REC)
D601 (PLAY)
D605 (PAUSE)
IC401 TC9312N SYSTEM CONTROL
AMS IN
AMS LED
REC LED
PLAY LED
PAUSE LED
REC MUTE
LINE MUTE
D311 1SS202-1
Q306 DTA144ES REC MONITOR ON SW
Q426 DTA144ES INVERTER
D307, 308 1SS202-1
D406-409 1SS202-1
Q407-40 DIRECT FUN
WHEN ■ BUTTON IS PRESSED : 0
WHEN ◀◀ BUTTON IS PRESSED : 0
WHEN ▶▶ BUTTON IS PRESSED : 4.5
WHEN ❚❚ BUTTON IS PRESSED : 0
WHEN ○ BUTTON IS PRESSED : 0
MOMENTARILY WHEN POWER SW IS PRESSED "L"
155μS
195mVP-P
GND
OSC
RESET
SHUT-OFF
HEAD SWITCH
MOTOR DRIVE (FWD)
MOTOR DRIVE (REV)
SOLENOID (PAUSE)
SOLENOID (HEAD)
SOLENOID (DIRECTION)
Q405 2SA1175 SHUT-OFF DET
Q601 2SC2603-F LED DRIVE
Q414, 415 2SD1387 MOTOR DRIVE
Q416, 417 2SB1013 MOTOR DRIVE
Q418 2SD809-K MOTOR POWER SWITCH
Q419 DTC144ES FF, REW/FWD, REV SELECT
PH1401 SP1201 SHUT-OFF DET
D417 1SS202-1
[SLIDE SWITCH BOARD (1/2)]
[CONTROL SWITCH BOARD (1/3)]
[PHOTO TR BOARD]
D602, 603 GL-8PG1
D603 (REV)
D602 (FWD)
S801-2 DIRECTION REV FWD
M801 REEL MOTOR
[MOTOR BOARD (1/2)]
PM801 SOLENOID (PAUSE)
PM802 SOLENOID (HEAD)
R447 22 (1/4W)

FH-11/15R
TC-118/158R


16
17
18
19
20
21
22
23
24
25
D101,102,201,202 ISS202-I
IC302 LA3220 AGC AMP
Q102,202 2SD1020 LINE MUTE
Q302 2SC2603F AGC MUTE
CN1
PB OUT(R-CH)
GND
PB OUT(L-CH)
REC IN (L-CH)
REC IN (R-CH)
TC STOP
TC FUNCTION(PLAY)
SIRCS(TC-158R ONLY)
GND
B+ IN
STOP
PLAY
Q312 2SB548-R, Q313,314 2SC2603F REG
D306 HZ11A1L
Q404 2SD809-K REG
Q402,403 2SC2603F B+ VOLTAGE DROP DETECTION
Q401 2SD809-K REG
D402 HZ6R11
D401 HZ11B2L
D312 ISS202-I
MOMENTARILY WHEN POWER SW IS PRESSED "L"
MOMENTARILY WHEN POWER SW IS PRESSED "H"
Q412 DTA144ES DIRECT FUNCTION PLAY
Q410,411 DTC144ES DIRECT FUNCTION PLAY
D410 ISS202-I
Q407-409 DTC144ES DIRECT FUNCTION STOP
TC-158R ONLY
Q406 DTC144ES HALF
S802 HALF DET
【DETECTION SWITCH BOARD(1/3)】
【SWITCH BOARD(1/3)】
S3 DIRECTION MODE
CASSETTE IS INSERTED: 0 NOT INSERTED: 3.5
CASSETTE IS INSERTED: 1.95 NOT INSERTED: 0
Q501 DTA144ES FF MODE
D503 ISS202-I
IC501
D501,502 ISS202-I
Q502 DTA144ES SIRCS INPUT DET
IC501 M50761 REMOCON
1.25μS 0.5VP-P
1.25μS 0.54VP-P
WHEN AMS BUTTON IS PRESSED: 0
WHEN ◀ BUTTON IS PRESSED: 0
WHEN ▶ BUTTON IS PRESSED: 0
【REC DETECT BOARD】
【SWITCH BOARD(1/3)】
S806 ERASE PROOF (REV)
S805 ERASE PROOF (FWD)
S2 TIMER
REC OFF PLAY
D403-405 ISS202-I
S801-1 DIRECTION REV FWD
Q421 DTA144ES REC PAWL DET
Q422 DTC144ES REC PAWL DET
【DETECTION SWITCH BOARD(1/3)】
S607 (REC)
S604 (FWD)
S605 (REV)
S609 AMS
S608 REC MUTE
S606 (PAUSE)
S602 (REW)
S603 (FF)
S601 (STOP)
【CONTROL SWITCH BOARD(1/3)】
【SLIDE SWITCH BOARD(1/2)】
【MOTOR BOARD(1/2)】
D801 ISS202-I
D411,412,414,415 ISS202-I
Q413 DTA114ES RETRIGGER PROTECT SWITCH
D413 ISS202-I
M802 CAPSTAN MOTOR
S401 RETRIGGER PROOF
Q420 2SD1387 SOLENOID DRIVE
PM801 SOLENOID (PAUSE)
PM802 SOLENOID (HEAD)
PM803 SOLENOID (DIRECTION)
TC-158R ONLY

Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- ⇨ : signal path.
- Components for right channel have same values as for left channel. Reference numbers are coded from 200.
- ⏦ : fusible resistor.
- ━ : B+ bus.
- ▭ : adjustment for repair.
- AC voltage readings in the bias oscillator with a VTVM.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.
- ▶ : FWD ◀ : REV
  ◀◀ : REW ● : REC
  ❚❚ : PAUSE No mark : STOP
  ●/◀ : REC REV
  ▶▶ : FF
  O : REC MUTE
  ●/▶ : REC FWD
- Waveforms are taken to ground in NO SIGNAL mode by using oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Switch

Ref. No.	Switch	Position
S1	DOLBY NR	OFF
S2	TIMER	OFF
S3	DIRECTION MODE	⇄
S301	ISS	1
S401	RETRIGGER PROOF	OFF
S601	■ (STOP)	OFF
S602	◀◀ (REW)	OFF
S603	▶▶ (FF)	OFF
S604	▶ (FWD)	OFF
S605	◀ (REV)	OFF
S606	❚❚ (PAUSE)	OFF
S607	● (REC)	OFF
S608	O (REC MUTE)	OFF
S609	AMS	OFF
S801	DIRECTION	FWD
S802	HALF DET	OFF
S803	70/120 μ	OFF
S804	METAL	OFF
S805	ERASE PROOF (FWD)	OFF
S806	ERASE PROOF (REV)	OFF

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

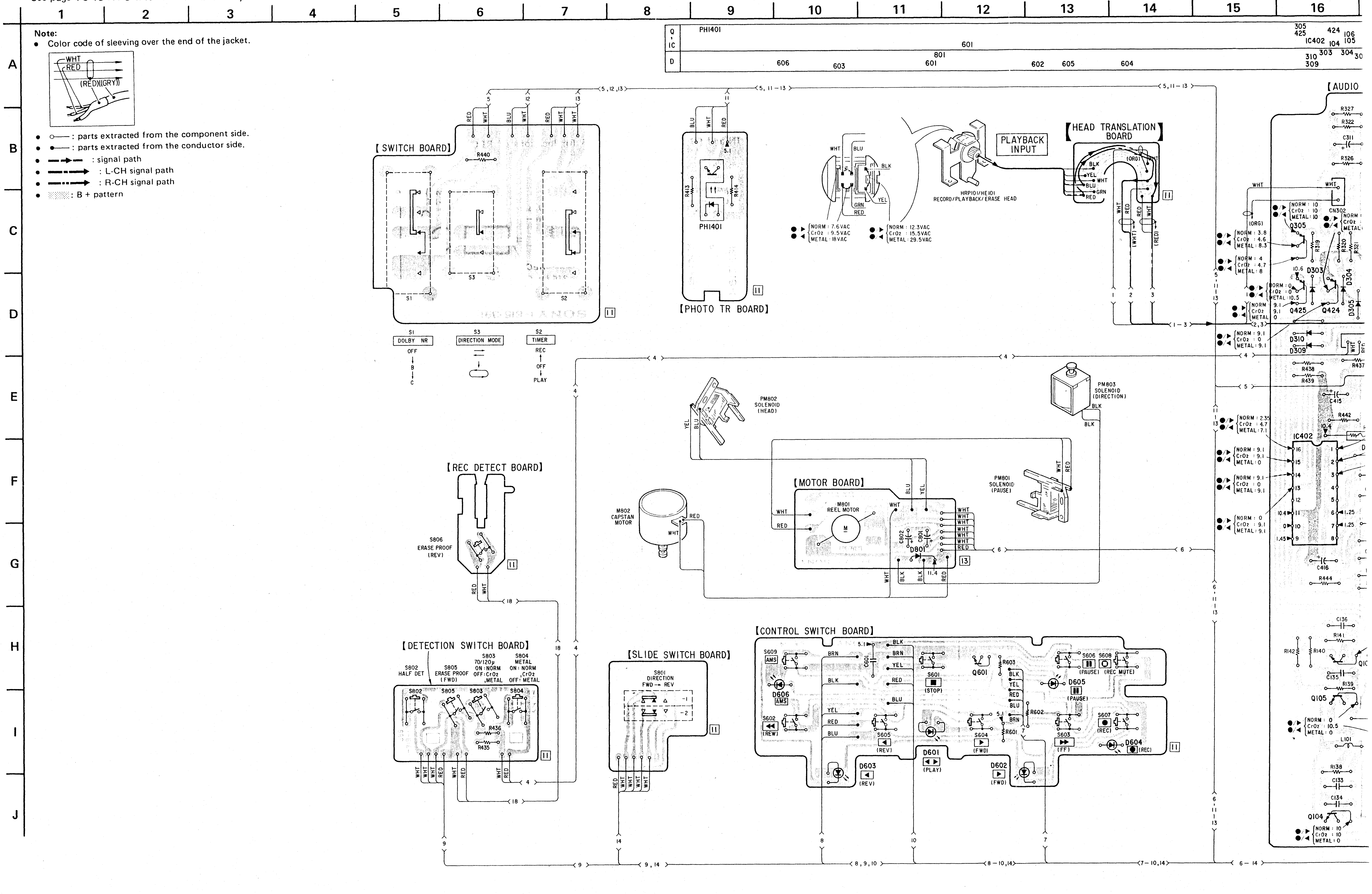
SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM

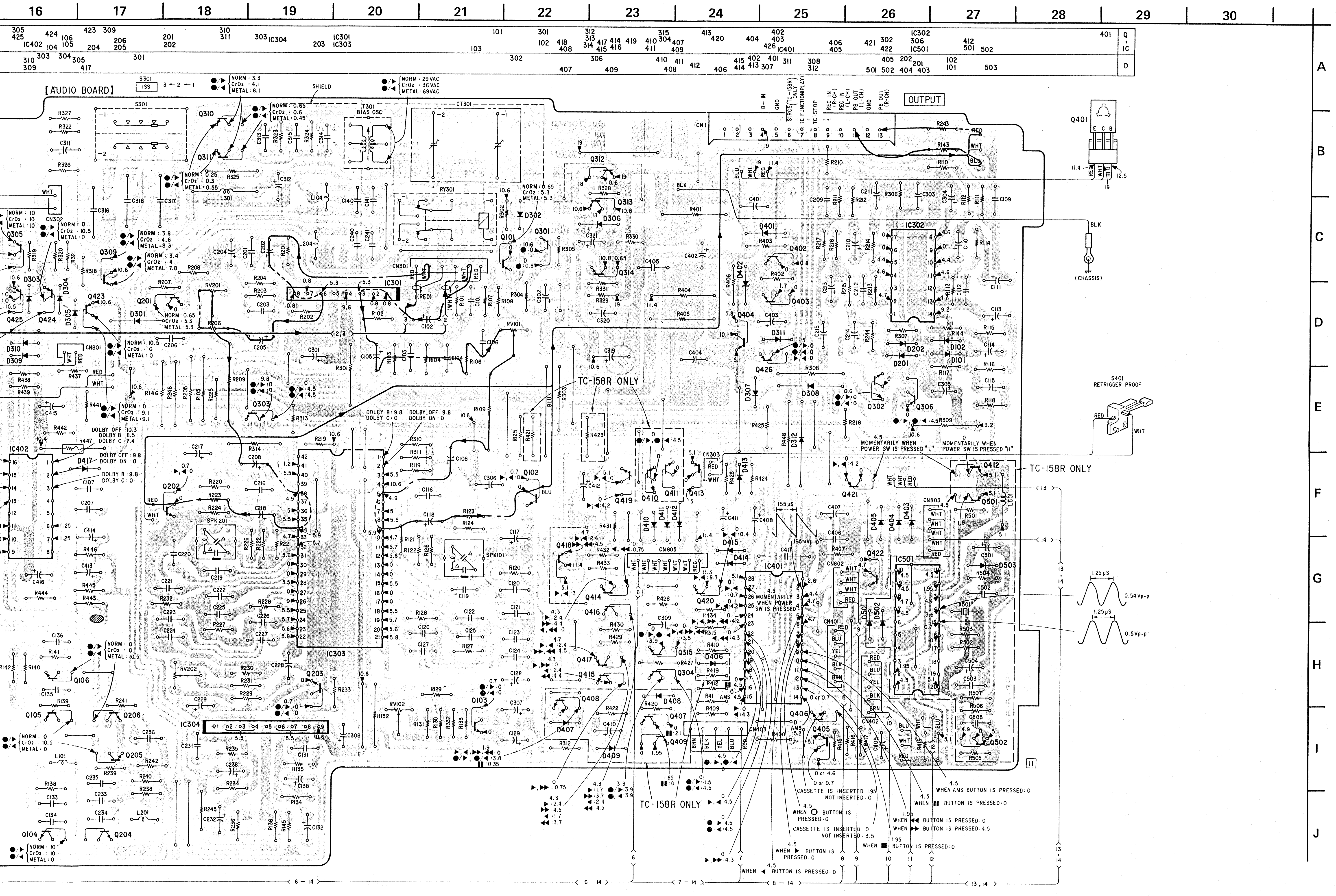
- See page TC-18 for Semiconductor Lead Layouts.

Note:

- Color code of sleeving over the end of the jacket.
- ○——: parts extracted from the component side.
- ●——: parts extracted from the conductor side.
- ━━▶━━ : signal path
- ━━·━━▶ : L-CH signal path
- ━━··━━▶ : R-CH signal path
- ▨ : B + pattern


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J
WHT
RED
(RED)(GRY)
Q, IC
D
PH1401
601
305 425 424 106 IC402 104 105
606 603 801 601 602 605 604
310 303 304 309
【SWITCH BOARD】
R440
S1 S3 S2
S1 DOLBY NR OFF B C
S3 DIRECTION MODE
S2 TIMER REC OFF PLAY
【PHOTO TR BOARD】
R413 R414
HRP101/HE101 RECORD/PLAYBACK/ERASE HEAD
PLAYBACK INPUT
【HEAD TRANSLATION BOARD】
NORM : 7.6VAC CrO2 : 9.5VAC METAL : 18VAC
NORM : 12.3VAC CrO2 : 15.5VAC METAL : 29.5VAC
【AUDIO
PM802 SOLENOID (HEAD)
PM803 SOLENOID (DIRECTION)
PM801 SOLENOID (PAUSE)
【REC DETECT BOARD】
S806 ERASE PROOF (REV)
M802 CAPSTAN MOTOR
【MOTOR BOARD】
M801 REEL MOTOR
C802 C801 D801
【DETECTION SWITCH BOARD】
S802 HALF DET
S805 ERASE PROOF (FWD)
S803 70/120μ ON : NORM OFF : CrO2, METAL
S804 METAL ON : NORM, CrO2 OFF : METAL
R436 R435
【SLIDE SWITCH BOARD】
S801 DIRECTION FWD → REV
【CONTROL SWITCH BOARD】
S609 AMS
D606 AMS
S602 (REW)
C601
S601 (STOP)
Q601
R603
S606 (PAUSE) S608 (REC MUTE)
D605 (PAUSE)
S605 (REV)
D601 (PLAY)
S604 (FWD)
R601 R602
S603 (FF)
S607 (REC)
D604 (REC)
D603 (REV)
D602 (FWD)
Q305 Q425 Q424 D303 D304 D305 D309 D310
IC402
R438 R439 R437 C415 R442 C416 R444
C136 R141 R142 R140 C135 R139 Q105 L101 R138 C133 C134 Q104

FH-11/15R
TC-118/158R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27
28
29
30
A
B
C
D
E
F
G
H
I
J
Q
IC
D
[AUDIO BOARD]
S301
ISS
3 — 2 — 1
SHIELD
T301
BIAS OSC
CT301
RY301
CN1
B+ IN
GND
SIRCS (TC-158R) ONLY
TC FUNCTION(PLAY)
TC STOP
REC IN (R-CH)
REC IN (L-CH)
PB OUT (L-CH)
GND
PB OUT (R-CH)
OUTPUT
Q401
E C B
(CHASSIS)
BLK
RED
WHT
BLU
NORM : 3.3
CrO2 : 4.1
METAL : 8.1
NORM : 29 VAC
CrO2 : 36 VAC
METAL : 69 VAC
NORM : 0.65
CrO2 : 0.6
METAL : 0.45
NORM : 0.25
CrO2 : 0.3
METAL : 0.55
NORM : 0.65
CrO2 : 5.3
METAL : 5.3
IC301
IC302
IC303
IC304
IC401
IC402
IC501
CN301
CN302
CN303
CN401
CN402
CN403
CN801
CN802
CN803
CN805
SPK101
SPK201
TC-158R ONLY
DOLBY B : 9.8
DOLBY C : 0
DOLBY OFF : 9.8
DOLBY ON : 0
DOLBY OFF : 10.3
DOLBY B : 8.5
DOLBY C : 7.4
MOMENTARILY WHEN POWER SW IS PRESSED "L"
MOMENTARILY WHEN POWER SW IS PRESSED "H"
MOMENTARILY WHEN POWER SW IS PRESSED "L"
S401
RETRIGGER PROOF
1.25 μS
0.54 Vp-p
0.5 Vp-p
155 μS
195 mVp-p
X501
AMS
CASSETTE IS INSERTED : 1.95
NOT INSERTED : 0
CASSETTE IS INSERTED : 0
NOT INSERTED : 3.5
WHEN ○ BUTTON IS PRESSED : 0
WHEN ▶ BUTTON IS PRESSED : 0
WHEN ◀ BUTTON IS PRESSED : 0
WHEN ■ BUTTON IS PRESSED : 0
WHEN AMS BUTTON IS PRESSED : 0
WHEN ❚❚ BUTTON IS PRESSED : 0
WHEN ◀◀ BUTTON IS PRESSED : 0
WHEN ▶▶ BUTTON IS PRESSED : 4.5
6 — 14
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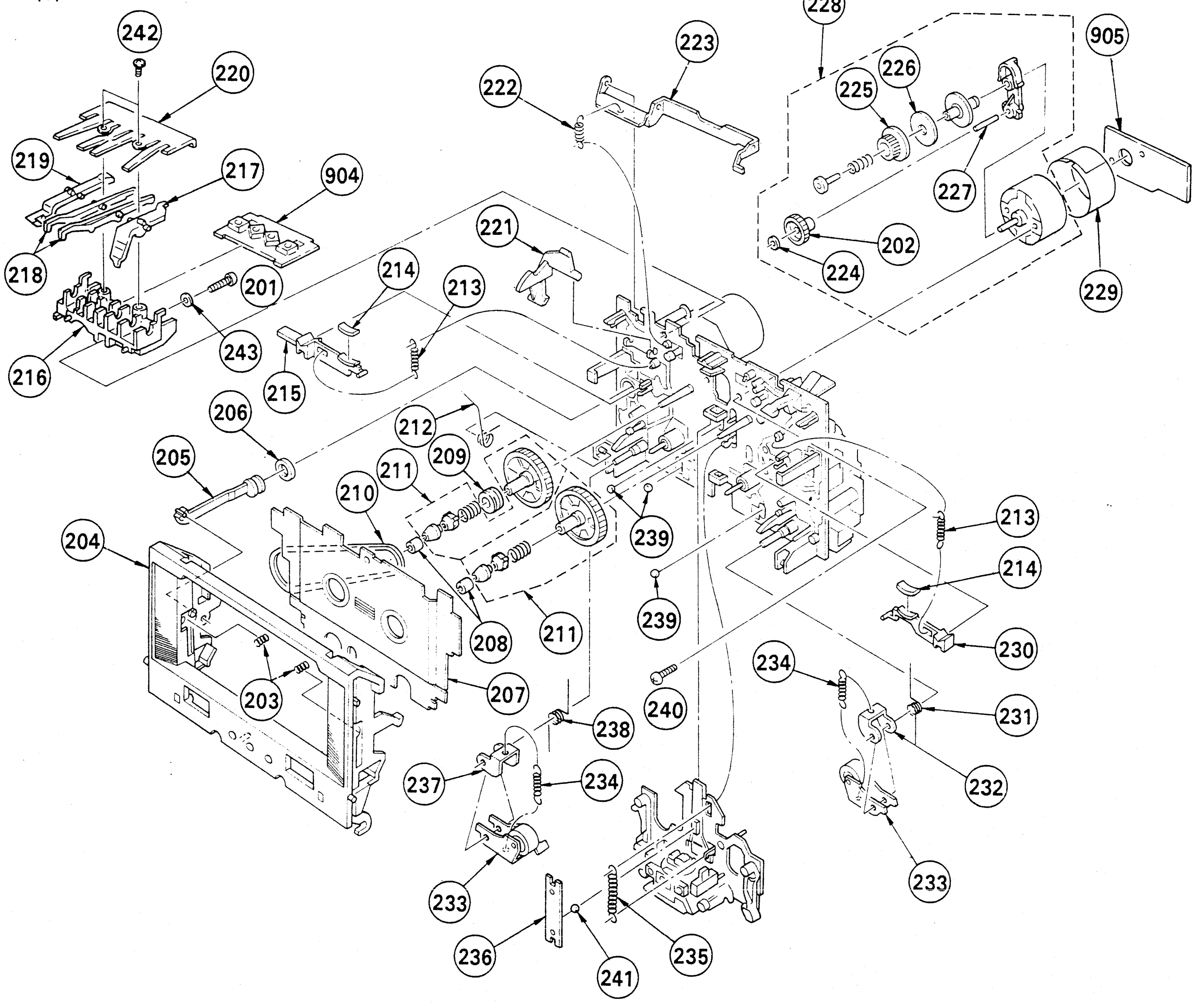
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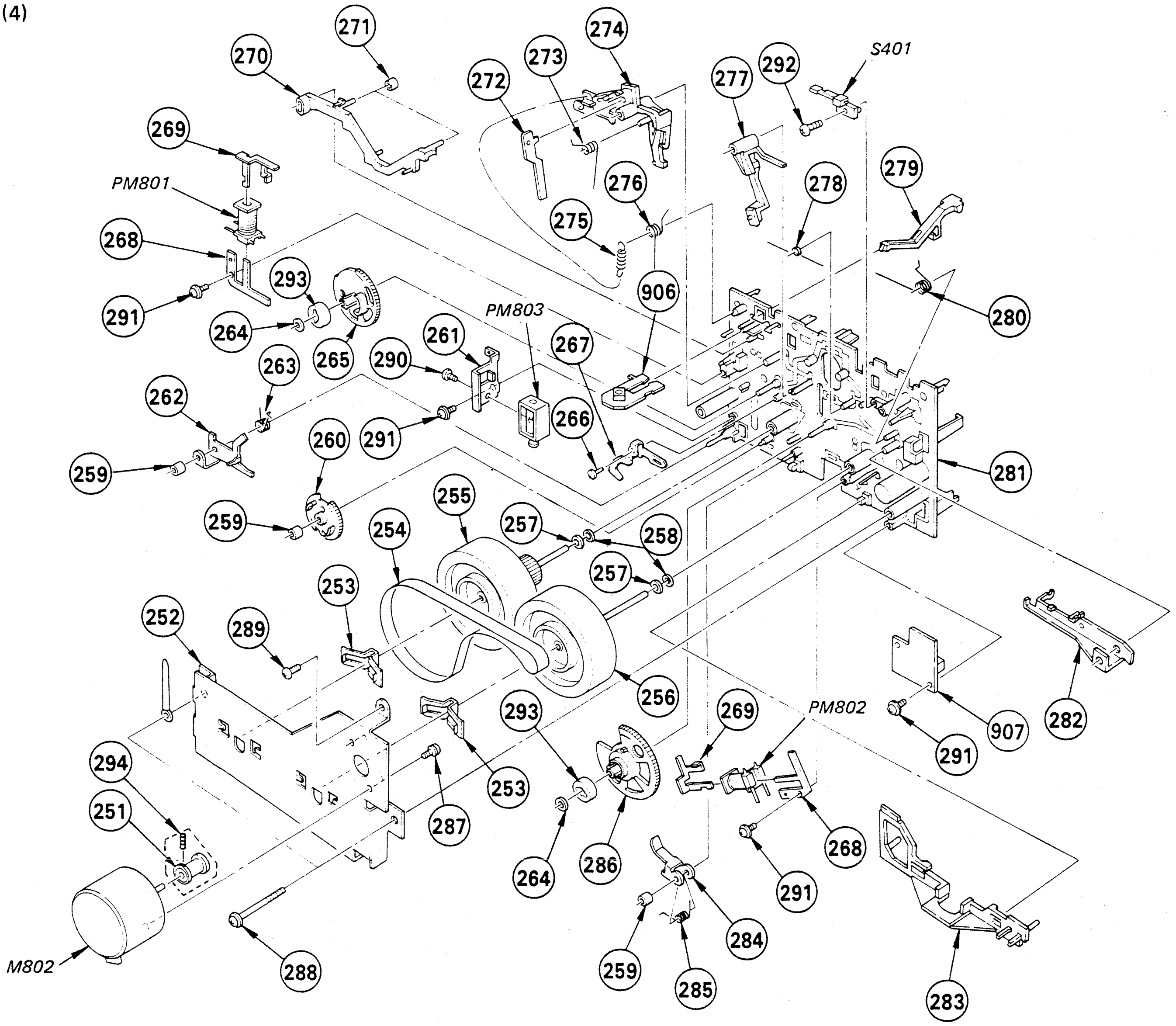
No.	Part No.	Description	Remarks
201	7-685-865-01	SCREW +BVTT 2.6X12 (S)	
202	3-575-332-00	GEAR, FR	
203	3-319-721-01	SPRING, COMPRESSION	
204	3-319-700-01	HOLDER, CASSETTE	
205	3-319-613-01	PISTON (B)	
206	3-312-441-00	RING, PISTON	
207	3-313-292-11	RETAINER, CASSETTE	
208	3-319-607-01	BUSHING, REEL TABLE	
209	3-319-657-01	PULLEY (B) CB	
210	3-325-510-01	BELT (B), SQUARE	
211	X-3319-617-1	PULLEY ASSY, MOTOR	
212	3-319-614-01	SPRING	
213	3-319-694-01	SPRING, TENSION	
214	3-575-346-01	FELT, BREKE	
215	*3-319-611-01	LEVER (LEFT), BACK TENSION	
216	3-319-670-01	HOLDER, SWITCH, DETECTION	
217	3-319-605-01	LEVER, METAL DETECTION	
218	3-319-603-01	LEVER, REC DETECTION	
219	3-319-604-01	LEVER, HALF DETECTION	
220	3-319-602-01	SPRING	
221	3-319-669-01	LEVER, EJECT	
222	3-312-432-00	SPRING, TENSION	
223	*3-319-678-01	LEVER, SWITCH LIFT	
224	3-307-394-00	RETAINER (B), THRUST	
225	3-575-324-00	GEAR, LIMITER	
226	3-564-027-11	FELT, LIMITER	
227	3-575-304-00	SHAFT, GEAR, FR	
228	X-3319-612-1	MOTOR ASSY, REEL	
229	3-575-457-00	PLATE (B), SHIELD, MOTOR	
230	*3-319-615-01	LEVER (RIGHT), BACK TENSION	
231	3-319-650-01	SPRING (R)	
232	*3-319-652-01	PLATE (RIGHT), LIMITER	
233	X-3319-607-1	PINCH LEVER ASSY	
234	3-319-686-01	SPRING, TENSION	
235	3-319-685-01	SPRING, TENSION	
236	3-319-601-01	SPRING	
237	*3-319-653-01	PLATE (LEFT), LIMITER	
238	3-319-651-01	SPRING (L)	
239	7-671-112-01	STEEL, BALL	
240	7-621-775-60	SCREW +B 2.6X12	
241	7-671-112-11	BALL, STEEL	
242	7-685-102-21	SCREW +PTP 2.6X4 TYPE2 SLIT	
243	7-688-002-01	W 2.6, SMALL	
904	*1-614-696-11	PC BOARD, DETECTION SW	
905	*1-613-522-11	PC BOARD, TRANSLATION	

(4)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S401
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PM801
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PM803
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PM802
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M802
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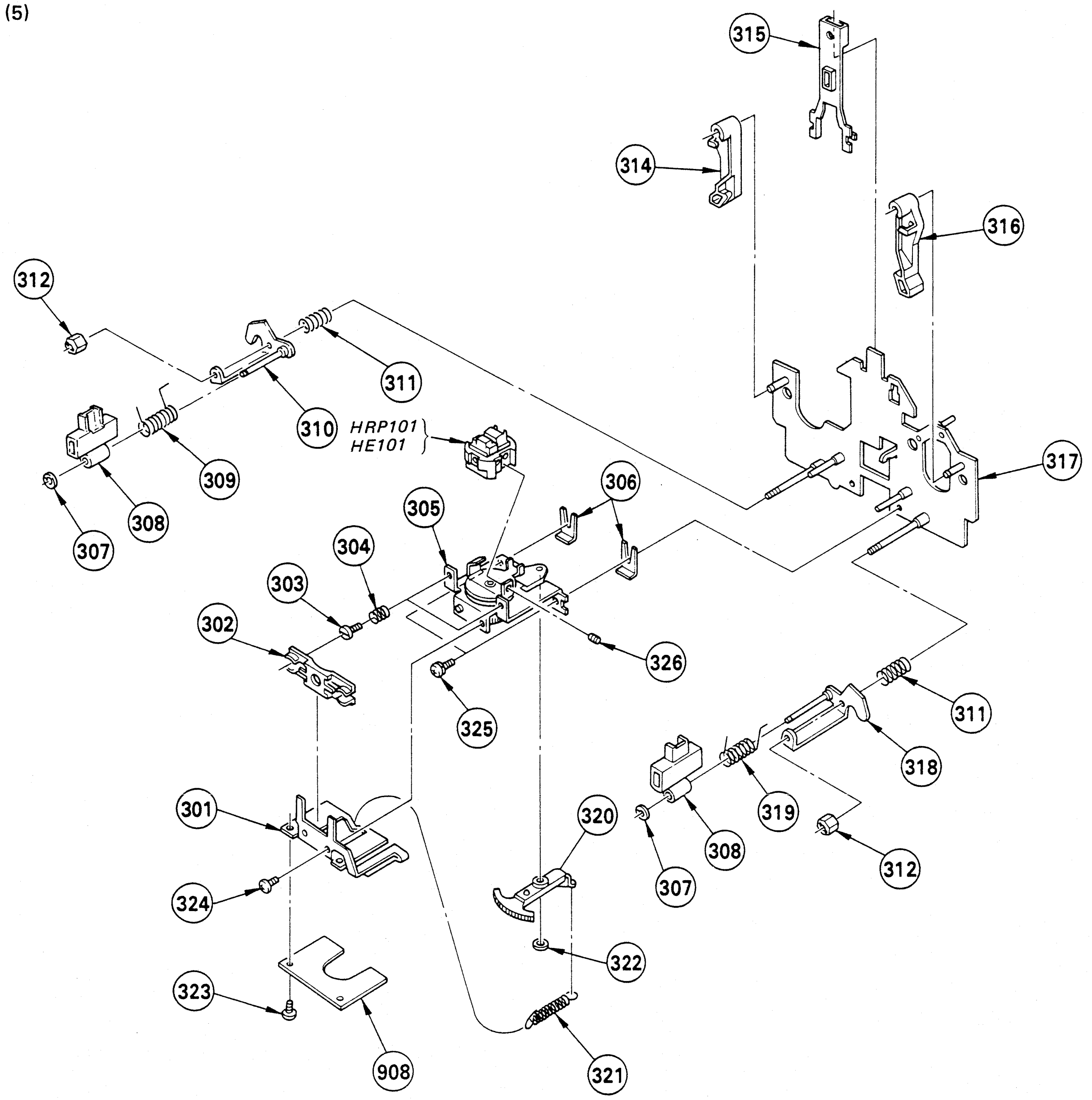
No.	Part No.	Description	REMARKS
251	X-3319-617-1	PULLEY ASSY, MOTOR	294
252	*3-319-665-01	RETAINER, THRUST	
253	3-319-608-01	RETAINER, THRUST	
254	3-319-630-01	BELT (R), CAPSTAN	
255	X-3319-606-1	FLYWHEEL (T) ASSY	
256	X-3319-601-1	FLYWHEEL ASSY	
257	3-701-438-11	WASHER, 2.5	
258	3-307-482-00	WASHER, LUMILER	
259	3-319-607-01	BUSHING, REEL TABLE	
260	3-319-674-01	GEAR, REVERSE CAM	
261	*3-319-639-01	BRACKET, TRIGGER PM	
262	*3-319-628-01	LEVER, REVERSE TRIGGER	
263	3-319-648-01	SPRING	
264	3-307-394-00	RETAINER (B), THRUST	
265	3-319-688-01	GEAR, PAUSE CAM	
266	*3-319-664-01	SHAFT, CONTROL LEVER	
267	*3-319-683-01	LEVER, CONTROL, TRIGGER	
268	3-307-332-00	ARBOR, FIXED	
269	3-307-333-00	ARBOR, TRIGGER	
270	*3-319-668-01	PLATE, BRAKE	
271	3-319-662-01	RUBBER, BRAKE	
272	3-319-612-01	SPRING	
273	3-319-606-01	SPRING	
274	*X-3319-614-1	LEVER ASSY, PAUSE	
275	3-555-124-00	SPRING, TENSION	
276	3-319-637-01	SPRING (R)	
277	*X-3319-615-1	LEVER ASSY, FWD LOCK	
278	3-319-649-01	SPRING	
279	3-319-666-01	LEVER (RIGHT), REC DETECTION	
280	3-319-633-01	SPRING	
281	X-3319-611-1	CHASSIS ASSY, MECHANICAL	
282	*3-319-676-01	LEVER, FWD	
283	*3-319-681-01	SLIDER, REVERSE	
284	*3-319-658-01	LEVER, TRIGGER KICK	
285	3-319-660-01	SPRING	
286	3-319-689-01	GEAR, FWD CAM	
287	7-628-253-95	SCREW +PS 2.6X4	
288	7-685-879-01	SCREW +BVTT 3X30 (S)	
289	7-685-646-21	SCREW +BVTP 3X8 (S)	
290	7-685-850-01	SCREW +BVTT 2X3 (S)	
291	7-687-204-11	TOTSU PTPWH 2X6 NON-SLIT, TYPE2	
292	7-685-792-01	SCREW +PTT 2.6X5	
293	1-452-202-00	MAGNET	
294	7-621-733-08	SET-SCT, HEX 2X4 FLAT POINT	
906	*1-612-727-11	PC BOARD, REC DET	
907	*1-614-396-11	PC BOARD, SLIDE SW	

(5)



No.	Part No.	Description	REMARKS
301	3-319-620-01	PLATE, ORNAMENTAL, HEAD	
302	3-319-644-01	STOPPER	
303	3-319-663-01	SCREW, ADJUSTMENT, AZIMUTH	
304	3-307-460-00	SPRING, COMPRESSION	
305	X-3319-613-1	BRACKET COMPLETE ASSY, HEAD	
306	3-307-477-01	SEAM (A), HEAD ADJUSTMENT	
	3-307-477-11	SEAM (A), HEAD ADJUSTMENT	
	3-307-477-21	SEAM (A), HEAD ADJUSTMENT	
	3-307-477-31	SEAM (A), HEAD ADJUSTMENT	
	3-307-477-41	SEAM (A), HEAD ADJUSTMENT	
307	3-307-394-00	RETAINER (B), THRUST	
308	3-306-269-01	GUIDE, TAPE	
309	3-306-249-00	SPRING (LEFT)	
310	*X-3319-609-1	LEVER (LEFT) ASSY, GUIDE	
311	3-537-215-00	SPRING, COMPRESSION	

No.	Part No.	Description	REMARKS
312	3-319-638-01	NUT, ADJUSTMENT	
314	3-319-643-01	LEVER (L), P ROLLER SELECTION	
315	3-319-684-01	PROTECTOR, EDGE	
316	3-319-642-01	LEVER (R), P ROLLER SELECTION	
317	*X-3319-610-1	CHASSIS ASSY, REVERSE HEAD	
318	*X-3319-608-1	LEVER (RIGHT) ASSY, GUIDE	
319	3-306-250-00	SPRING (RIGHT)	
320	3-319-625-01	GEAR, ROTARY HEAD	
321	3-306-258-01	SPRING, TENSION	
322	7-624-102-04	STOP RING 1.5	
323	7-685-850-01	SCREW +BVTT 2X3 (S)	
324	7-627-553-17	SCREW, PRECISION +P 2X2	
325	7-628-253-05	SCREW +PS 2X4	
326	7-621-710-26	SET-SCREW, SLOT 2X3 FLAT POINT	
908	*1-612-729-11	PC BOARD, HEAD TRANSLATION	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	1-548-563-91	COUNTER, TAPE (MIDDLE TYPE)			
902	*A-2056-270-A	(TC-118)....MOUNTED PCB, AUDIO			
	*A-2056-271-A	(TC-158R)...MOUNTED PCB, AUDIO			
903	*1-615-390-11	PC BOARD, CONTROL SWITCH			
904	*1-614-696-11	PC BOARD, DETECTION SW			
905	*1-613-522-11	PC BOARD, TRANSLATION			
906	*1-612-727-11	PC BOARD, REC DETECT			
907	*1-614-396-11	PC BOARD, SLIDE SW			
908	*1-612-729-11	PC BOARD, HEAD TRANSLATION			
C101	1-162-292-31	CERAMIC	680PF	10%	50V
C102	1-123-384-00	ELECT	10MF	20%	50V
C103	1-136-157-00	FILM	0.022MF	5%	50V
C104	1-123-307-00	ELECT	100MF	20%	10V
C105	1-123-613-00	ELECT	3.3MF	20%	50V
C106	1-136-158-00	FILM	0.027MF	5%	50V
C107	1-136-158-00	FILM	0.027MF	5%	50V
C108	1-123-369-00	ELECT	4.7MF	20%	25V
C109	1-162-294-31	CERAMIC	0.001MF	10%	50V
C110	1-123-369-00	ELECT	4.7MF	20%	25V
C111	1-123-307-00	ELECT	100MF	20%	10V
C113	1-123-356-00	ELECT	10MF	20%	16V
C114	1-123-369-00	ELECT	4.7MF	20%	25V
C115	1-123-369-00	ELECT	4.7MF	20%	25V
C116	1-110-201-00	MYLAR	0.0033MF	5%	50V
C117	1-123-298-00	ELECT	470MF	20%	6.3V
C118	1-123-369-00	ELECT	4.7MF	20%	25V
C119	1-110-203-00	MYLAR	0.0047MF	5%	50V
C120	1-136-173-00	FILM	0.47MF	5%	50V
C121	1-136-167-00	FILM	0.15MF	5%	50V
C122	1-136-155-00	FILM	0.015MF	5%	50V
C123	1-136-169-00	FILM	0.22MF	5%	50V
C124	1-136-163-00	FILM	0.068MF	5%	50V
C125	1-136-161-00	FILM	0.047MF	5%	50V
C126	1-110-205-00	MYLAR	0.0068MF	5%	50V
C127	1-136-153-00	FILM	0.01MF	5%	50V
C128	1-123-369-00	ELECT	4.7MF	20%	25V
C129	1-123-382-00	ELECT	3.3MF	20%	50V
C131	1-136-162-00	FILM	0.056MF	5%	50V
C132	1-123-318-00	ELECT	33MF	20%	10V
C133	1-136-153-00	FILM	0.01MF	5%	50V
C134	1-110-200-00	MYLAR	0.0027MF	5%	50V
C135	1-136-157-00	FILM	0.022MF	5%	50V
C136	1-110-205-00	MYLAR	0.0068MF	5%	50V
C138	1-123-369-00	ELECT	4.7MF	20%	25V
C140	1-107-036-00	MICA	68PF	5%	500V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C141	1-107-165-00	MICA	56PF	5%	500V
C201	1-162-292-31	CERAMIC	680PF	10%	50V
C202	1-123-384-00	ELECT	10MF	20%	50V
C203	1-136-157-00	FILM	0.022MF	5%	50V
C204	1-123-307-00	ELECT	100MF	20%	10V
C205	1-123-613-00	ELECT	3.3MF	20%	50V
C206	1-136-158-00	FILM	0.027MF	5%	50V
C207	1-136-158-00	FILM	0.027MF	5%	50V
C208	1-123-369-00	ELECT	4.7MF	20%	25V
C209	1-162-294-31	CERAMIC	0.001MF	10%	50V
C210	1-123-369-00	ELECT	4.7MF	20%	25V
C211	1-123-307-00	ELECT	100MF	20%	10V
C213	1-123-356-00	ELECT	10MF	20%	16V
C214	1-123-369-00	ELECT	4.7MF	20%	25V
C215	1-123-369-00	ELECT	4.7MF	20%	25V
C216	1-110-201-00	MYLAR	0.0033MF	5%	50V
C217	1-123-298-00	ELECT	470MF	20%	6.3V
C218	1-123-369-00	ELECT	4.7MF	20%	25V
C219	1-110-203-00	MYLAR	0.0047MF	5%	50V
C220	1-136-173-00	FILM	0.47MF	5%	50V
C221	1-136-167-00	FILM	0.15MF	5%	50V
C222	1-136-155-00	FILM	0.015MF	5%	50V
C223	1-136-169-00	FILM	0.22MF	5%	50V
C224	1-136-163-00	FILM	0.068MF	5%	50V
C225	1-136-161-00	FILM	0.047MF	5%	50V
C226	1-110-205-00	MYLAR	0.0068MF	5%	50V
C227	1-136-153-00	FILM	0.01MF	5%	50V
C228	1-123-369-00	ELECT	4.7MF	20%	25V
C229	1-123-382-00	ELECT	3.3MF	20%	50V
C231	1-136-162-00	FILM	0.056MF	5%	50V
C232	1-123-318-00	ELECT	33MF	20%	10V
C233	1-136-153-00	FILM	0.01MF	5%	50V
C234	1-110-200-00	MYLAR	0.0027MF	5%	50V
C235	1-136-157-00	FILM	0.022MF	5%	50V
C236	1-110-205-00	MYLAR	0.0068MF	5%	50V
C238	1-123-369-00	ELECT	4.7MF	20%	25V
C240	1-107-036-00	MICA	68PF	5%	500V
C241	1-107-165-00	MICA	56PF	5%	500V
C301	1-123-308-00	ELECT	220MF	20%	10V
C302	1-123-382-00	ELECT	3.3MF	20%	50V
C303	1-123-306-00	ELECT	47MF	20%	10V
C304	1-123-306-00	ELECT	47MF	20%	10V
C305	1-123-308-00	ELECT	220MF	20%	10V
C306	1-123-321-00	ELECT	220MF	20%	16V
C307	1-123-381-00	ELECT	2.2MF	20%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description
C308	1-123-356-00	ELECT 10MF 20% 16V
C309	1-123-356-00	ELECT 10MF 20% 16V
C311	1-123-379-00	ELECT 0.47MF 20% 50V
C312	1-123-356-00	ELECT 10MF 20% 16V
C313	1-130-289-00	FILM 0.0047MF 5% 100V
C314	1-130-289-00	FILM 0.0047MF 5% 100V
C315	1-130-295-00	FILM 0.0082MF 5% 100V
C316	1-129-713-00	FILM 0.0082MF 10% 630V
C317	1-129-706-00	FILM 0.0022MF 10% 630V
C318	1-129-705-00	FILM 0.0018MF 10% 630V
C319	1-123-321-00	ELECT 220MF 20% 16V
C320	1-123-332-00	ELECT 47MF 20% 16V
C321	1-123-318-00	ELECT 33MF 20% 10V
C401	1-123-333-00	ELECT 100MF 20% 16V
C402	1-123-321-00	ELECT 220MF 20% 16V
C403	1-123-306-00	ELECT 47MF 20% 10V
C404	1-123-298-00	ELECT 470MF 20% 6.3V
C405	1-162-304-31	CERAMIC 0.0047MF 20% 16V
C406	1-110-206-00	MYLAR 0.0082MF 5% 50V
C407	1-123-381-00	ELECT 2.2MF 20% 50V
C408	1-123-356-00	ELECT 10MF 20% 16V
C409	1-123-611-00	ELECT 1MF 20% 50V
C410	1-123-380-00	(TC-158R ONLY)...ELECT 1MF 20% 50V
C411	1-123-307-00	ELECT 100MF 20% 10V
C412	1-123-321-00	ELECT 220MF 20% 16V
C413	1-123-380-00	ELECT 1MF 20% 50V
C414	1-123-380-00	ELECT 1MF 20% 50V
C415	1-123-308-00	ELECT 220MF 20% 10V
C416	1-123-381-00	ELECT 2.2MF 20% 50V
C417	1-161-494-00	CERAMIC 0.022MF 30% 25V
C501	1-123-381-00	(TC-158R ONLY)...ELECT 2.2MF 20% 50V
C502	1-162-284-31	(TC-158R ONLY)...CERAMIC 150PF 10% 50V
C503	1-162-284-31	(TC-158R ONLY)...CERAMIC 150PF 10% 50V
C504	1-123-356-00	(TC-158R ONLY)...ELECT 10MF 20% 16V
C505	1-162-282-31	(TC-158R ONLY)...CERAMIC 100PF 10% 50V
C601	1-161-494-00	CERAMIC 0.022MF 30% 25V
C801	1-123-318-00	ELECT 33MF 20% 16V
C802	1-123-318-00	ELECT 33MF 20% 16V
CN1	1-562-068-00	SOCKET, CONNECTOR 13P
CN301	*1-564-509-11	PLUG, CONNECTOR 6P
CN302	*1-564-505-11	PLUG, CONNECTOR 2P
CN303	*1-564-505-11	PLUG, CONNECTOR 2P
CN401	*1-564-508-11	PLUG, CONNECTOR 5P
CN402	*1-564-508-11	PLUG, CONNECTOR 5P
CN403	*1-564-508-11	PLUG, CONNECTOR 5P
CN801	*1-564-336-00	PIN, CONNECTOR 2P
CN802	*1-564-338-00	PIN, CONNECTOR 4P
CN803	*1-564-339-00	PIN, CONNECTOR 5P
CN805	*1-564-341-11	PIN, CONNECTOR 7P
CT301	1-141-225-00	CAP, TUNING, TRIMAR
D101	8-719-107-94	DIODE 1SS202-1
D102	8-719-107-94	DIODE 1SS202-1
D201	8-719-107-94	DIODE 1SS202-1

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D202	8-719-107-94	DIODE 1SS202-1
D301	8-719-107-94	DIODE 1SS202-1
D302	8-719-107-94	DIODE 1SS202-1
D303	8-719-107-94	DIODE 1SS202-1
D304	8-719-107-94	DIODE 1SS202-1
D305	8-719-107-94	DIODE 1SS202-1
D306	8-719-910-11	DIODE HZ11A1L
D307	8-719-107-94	DIODE 1SS202-1
D308	8-719-107-94	DIODE 1SS202-1
D309	8-719-107-94	DIODE 1SS202-1
D310	8-719-107-94	DIODE 1SS202-1
D311	8-719-107-94	DIODE 1SS202-1
D312	8-719-107-94	DIODE 1SS202-1
D401	8-719-910-15	DIODE HZ11B2L
D402	8-719-910-64	DIODE HZ6B1L
D403	8-719-107-94	DIODE 1SS202-1
D404	8-719-107-94	DIODE 1SS202-1
D405	8-719-107-94	DIODE 1SS202-1
D406	8-719-107-94	(TC-158R ONLY)...DIODE 1SS202-1
D407	8-719-107-94	(TC-158R ONLY)...DIODE 1SS202-1
D408	8-719-107-94	(TC-158R ONLY)...DIODE 1SS202-1
D409	8-719-107-94	(TC-158R ONLY)...DIODE 1SS202-1
D410	8-719-107-94	(TC-158R ONLY)...DIODE 1SS202-1
D411	8-719-107-94	DIODE 1SS202-1
D412	8-719-107-94	DIODE 1SS202-1
D413	8-719-107-94	DIODE 1SS202-1
D414	8-719-107-94	DIODE 1SS202-1
D415	8-719-107-94	DIODE 1SS202-1
D417	8-719-107-94	DIODE 1SS202-1
D501	8-719-107-94	(TC-158R ONLY)...DIODE 1SS202-1
D502	8-719-107-94	(TC-158R ONLY)...DIODE 1SS202-1
D503	8-719-107-94	(TC-158R ONLY)...DIODE 1SS202-1
D601	8-719-920-03	DIODE GL-8PG1
D602	8-719-920-03	DIODE GL-8PG1
D603	8-719-920-03	DIODE GL-8PG1
D604	8-719-918-65	DIODE GL-1PR102
D605	8-719-918-66	DIODE GL-1HY102
D606	8-719-918-67	DIODE GL-1EG102
D801	8-719-107-94	DIODE 1SS202-1
HE101	X-3319-616-1	HEAD UNIT ASSY
HRP101	X-3319-616-1	HEAD UNIT ASSY
IC301	8-759-800-36	IC LA3160
IC302	8-759-800-92	IC LA3220
IC303	8-752-018-70	IC CX20187
IC304	8-759-700-08	IC NJM4558S
IC401	8-759-204-31	IC TC9312N-001
IC402	8-759-700-46	IC CX10034
IC501	8-759-602-47	(TC-158R ONLY)...IC M50761-417P
L101	1-408-923-00	MICRO INDUCTOR 8.2MMH
L104	1-408-930-00	MICRO INDUCTOR 33MMH
L201	1-408-923-00	MICRO INDUCTOR 8.2MMH
L204	1-408-930-00	MICRO INDUCTOR 33MMH
L301	1-408-096-00	MICRO INDUCTOR 470UH
L501	1-408-579-00	(TC-158R ONLY)...MICRO INDUCTOR 220UH
M802	1-541-239-00	MOTOR (CAPSTAN)
PHI401	8-719-902-90	PHOTO INTERRUPTOR SPI201-20

ELECTRICAL PARTS

Ref.No.	Part No.	Description
PM801	1-454-316-00	SOLENOID, PLUNGER (PAUSE)
PM802	1-454-316-00	SOLENOID, PLUNGER (HEAD)
PM803	1-454-374-11	SOLENOID, PLUNGER (DIRECTION)
Q101	8-729-900-89	TRANSISTOR DTC144ES
Q102	8-729-102-03	TRANSISTOR 2SD1020
Q103	8-729-606-33	TRANSISTOR 2SC2603-F
Q104	8-729-900-89	TRANSISTOR DTC144ES
Q105	8-729-900-89	TRANSISTOR DTC144ES
Q106	8-729-900-89	TRANSISTOR DTC144ES
Q201	8-729-900-89	TRANSISTOR DTC144ES
Q202	8-729-102-03	TRANSISTOR 2SD1020
Q203	8-729-606-33	TRANSISTOR 2SC2603-F
Q204	8-729-900-89	TRANSISTOR DTC144ES
Q205	8-729-900-89	TRANSISTOR DTC144ES
Q206	8-729-900-89	TRANSISTOR DTC144ES
Q301	8-729-606-33	TRANSISTOR 2SC2603-F
Q302	8-729-606-33	TRANSISTOR 2SC2603-F
Q303	8-729-900-89	TRANSISTOR DTC144ES
Q304	8-729-900-89	TRANSISTOR DTC144ES
Q305	8-729-117-54	TRANSISTOR 2SA1175
Q306	8-729-900-65	TRANSISTOR DTA144ES
Q309	8-729-801-93	TRANSISTOR 2SD1387
Q310	8-729-606-33	TRANSISTOR 2SC2603-F
Q311	8-729-606-33	TRANSISTOR 2SC2603-F
Q312	8-729-154-82	TRANSISTOR 2SB548-R
Q313	8-729-606-33	TRANSISTOR 2SC2603-F
Q314	8-729-606-33	TRANSISTOR 2SC2603-F
Q315	8-729-900-89	TRANSISTOR DTC144ES
Q401	8-729-180-92	TRANSISTOR 2SD809-K
Q402	8-729-606-33	TRANSISTOR 2SC2603-F
Q403	8-729-606-33	TRANSISTOR 2SC2603-F
Q404	8-729-180-92	TRANSISTOR 2SD809-K
Q405	8-729-117-54	TRANSISTOR 2SA1175
Q406	8-729-900-89	TRANSISTOR DTC144ES
Q407	8-729-900-89	(TC-158R ONLY)...TRANSISTOR DTC144ES
Q408	8-729-900-89	(TC-158R ONLY)...TRANSISTOR DTC144ES
Q409	8-729-900-89	(TC-158R ONLY)...TRANSISTOR DTC144ES
Q410	8-729-900-89	(TC-158R ONLY)...TRANSISTOR DTC144ES
Q411	8-729-900-89	(TC-158R ONLY)...TRANSISTOR DTC144ES
Q412	8-729-900-65	(TC-158R ONLY)...TRANSISTOR DTA144ES
Q413	8-729-900-80	TRANSISTOR DTA114ES
Q414	8-729-801-93	TRANSISTOR 2SD1387
Q415	8-729-801-93	TRANSISTOR 2SD1387
Q416	8-729-801-83	TRANSISTOR 2SB1013
Q417	8-729-801-83	TRANSISTOR 2SB1013
Q418	8-729-180-92	TRANSISTOR 2SD809-K
Q419	8-729-900-89	TRANSISTOR DTC144ES
Q420	8-729-801-93	TRANSISTOR 2SD1387
Q421	8-729-900-65	TRANSISTOR DTA144ES
Q422	8-729-900-89	TRANSISTOR DTC144ES
Q423	8-729-900-65	TRANSISTOR DTA144ES
Q424	8-729-900-65	TRANSISTOR DTA144ES
Q425	8-729-900-65	TRANSISTOR DTA144ES
Q426	8-729-900-65	TRANSISTOR DTA144ES

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
Q501	8-729-900-65	(TC-158R ONLY)...TRANSISTOR DTA144ES			
Q502	8-729-900-65	(TC-158R ONLY)...TRANSISTOR DTA144ES			
Q601	8-729-606-33	TRANSISTOR 2SC2603-F			
R101	1-247-867-00	CARBON	33K	5%	1/6W
R102	1-247-883-00	CARBON	150K	5%	1/6W
R103	1-247-848-00	CARBON	5.1K	5%	1/6W
R104	1-247-808-00	CARBON	110	5%	1/6W
R105	1-247-839-00	CARBON	2.2K	5%	1/6W
R106	1-247-839-00	CARBON	2.2K	5%	1/6W
R107	1-247-841-00	CARBON	2.7K	5%	1/6W
R108	1-247-887-00	CARBON	220K	5%	1/6W
R109	1-247-823-00	CARBON	470	5%	1/6W
R110	1-247-871-00	CARBON	47K	5%	1/6W
R111	1-247-829-00	CARBON	820	5%	1/6W
R112	1-247-839-00	CARBON	2.2K	5%	1/6W
R113	1-247-859-00	CARBON	15K	5%	1/6W
R114	1-247-815-00	CARBON	220	5%	1/6W
R115	1-247-827-00	CARBON	680	5%	1/6W
R116	1-247-855-00	CARBON	10K	5%	1/6W
R117	1-247-835-00	CARBON	1.5K	5%	1/6W
R118	1-247-831-00	CARBON	1K	5%	1/6W
R119	1-247-831-00	CARBON	1K	5%	1/6W
R120	1-247-831-00	CARBON	1K	5%	1/6W
R121	1-247-846-00	CARBON	4.3K	5%	1/6W
R122	1-247-841-00	CARBON	2.7K	5%	1/6W
R123	1-247-839-00	CARBON	2.2K	5%	1/6W
R124	1-247-879-00	CARBON	100K	5%	1/6W
R125	1-247-839-00	CARBON	2.2K	5%	1/6W
R126	1-247-822-00	CARBON	430	5%	1/6W
R127	1-247-851-00	CARBON	6.8K	5%	1/6W
R128	1-247-827-00	CARBON	680	5%	1/6W
R129	1-247-863-00	CARBON	22K	5%	1/6W
R130	1-247-841-00	CARBON	2.7K	5%	1/6W
R131	1-247-855-00	CARBON	10K	5%	1/6W
R132	1-247-879-00	CARBON	100K	5%	1/6W
R133	1-247-831-00	CARBON	1K	5%	1/6W
R134	1-247-867-00	CARBON	33K	5%	1/6W
R135	1-247-867-00	CARBON	33K	5%	1/6W
R136	1-247-831-00	CARBON	1K	5%	1/6W
R138	1-247-819-00	CARBON	330	5%	1/6W
R139	1-247-847-00	CARBON	4.7K	5%	1/6W
R140	1-247-849-00	CARBON	5.6K	5%	1/6W
R141	1-247-845-00	CARBON	3.9K	5%	1/6W
R142	1-247-845-00	CARBON	3.9K	5%	1/6W
R143	1-247-839-00	CARBON	2.2K	5%	1/6W
R144	1-247-845-00	CARBON	3.9K	5%	1/6W
R145	1-247-879-00	CARBON	100K	5%	1/6W
R146	1-247-855-00	CARBON	10K	5%	1/6W
R201	1-247-867-00	CARBON	33K	5%	1/6W
R202	1-247-883-00	CARBON	150K	5%	1/6W
R203	1-247-848-00	CARBON	5.1K	5%	1/6W
R204	1-247-808-00	CARBON	110	5%	1/6W
R205	1-247-839-00	CARBON	2.2K	5%	1/6W
R206	1-247-839-00	CARBON	2.2K	5%	1/6W
R207	1-247-841-00	CARBON	2.7K	5%	1/6W
R208	1-247-887-00	CARBON	220K	5%	1/6W
R209	1-247-823-00	CARBON	470	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R210	1-247-871-00	CARBON	47K	5%	1/6W
R211	1-247-829-00	CARBON	820	5%	1/6W
R212	1-247-839-00	CARBON	2.2K	5%	1/6W
R213	1-247-859-00	CARBON	15K	5%	1/6W
R214	1-247-815-00	CARBON	220	5%	1/6W
R215	1-247-827-00	CARBON	680	5%	1/6W
R216	1-247-855-00	CARBON	10K	5%	1/6W
R217	1-247-835-00	CARBON	1.5K	5%	1/6W
R218	1-247-831-00	CARBON	1K	5%	1/6W
R219	1-247-831-00	CARBON	1K	5%	1/6W
R220	1-247-831-00	CARBON	1K	5%	1/6W
R221	1-247-846-00	CARBON	4.3K	5%	1/6W
R222	1-247-841-00	CARBON	2.7K	5%	1/6W
R223	1-247-839-00	CARBON	2.2K	5%	1/6W
R224	1-247-879-00	CARBON	100K	5%	1/6W
R225	1-247-839-00	CARBON	2.2K	5%	1/6W
R226	1-247-822-00	CARBON	430	5%	1/6W
R227	1-247-851-00	CARBON	6.8K	5%	1/6W
R228	1-247-827-00	CARBON	680	5%	1/6W
R229	1-247-863-00	CARBON	22K	5%	1/6W
R230	1-247-841-00	CARBON	2.7K	5%	1/6W
R231	1-247-855-00	CARBON	10K	5%	1/6W
R232	1-247-879-00	CARBON	100K	5%	1/6W
R233	1-247-831-00	CARBON	1K	5%	1/6W
R234	1-247-867-00	CARBON	33K	5%	1/6W
R235	1-247-867-00	CARBON	33K	5%	1/6W
R236	1-247-831-00	CARBON	1K	5%	1/6W
R238	1-247-819-00	CARBON	330	5%	1/6W
R239	1-247-847-00	CARBON	4.7K	5%	1/6W
R240	1-247-849-00	CARBON	5.6K	5%	1/6W
R241	1-247-845-00	CARBON	3.9K	5%	1/6W
R242	1-247-845-00	CARBON	3.9K	5%	1/6W
R243	1-247-839-00	CARBON	2.2K	5%	1/6W
R244	1-247-845-00	CARBON	3.9K	5%	1/6W
R245	1-247-879-00	CARBON	100K	5%	1/6W
R246	1-247-855-00	CARBON	10K	5%	1/6W
R301	1-247-224-00	CARBON	220	5%	1/2W
R302	1-247-863-00	CARBON	22K	5%	1/6W
R303	1-247-843-00	CARBON	3.3K	5%	1/6W
R304	1-247-847-00	CARBON	4.7K	5%	1/6W
R305	1-247-875-00	CARBON	68K	5%	1/6W
R306	1-247-903-00	CARBON	1M	5%	1/6W
R307	1-247-807-00	CARBON	100	5%	1/6W
R308	1-247-879-00	CARBON	100K	5%	1/6W
R309	1-247-224-00	CARBON	220	5%	1/2W
R310	1-247-871-00	CARBON	47K	5%	1/6W
R311	1-247-871-00	CARBON	47K	5%	1/6W
R312	1-247-847-00	CARBON	4.7K	5%	1/6W
R313	1-247-871-00	CARBON	47K	5%	1/6W
R314	1-214-777-00	METAL	100K	1%	1/4W
R315	1-247-855-00	CARBON	10K	5%	1/6W
R318	1-247-855-00	CARBON	10K	5%	1/6W
R319	1-247-825-00	CARBON	560	5%	1/6W
R320	1-247-844-00	CARBON	3.6K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R321	1-247-848-00	CARBON	5.1K	5%	1/6W
R322	1-247-855-00	CARBON	10K	5%	1/6W
R323	1-247-853-00	CARBON	8.2K	5%	1/6W
R324	1-247-853-00	CARBON	8.2K	5%	1/6W
R325	1-246-419-00	CARBON	5.6	5%	1/4W
R326	1-247-865-00	CARBON	27K	5%	1/6W
R327	1-247-855-00	CARBON	10K	5%	1/6W
R328	1-247-831-00	CARBON	1K	5%	1/6W
R329	1-247-839-00	CARBON	2.2K	5%	1/6W
R330	1-247-831-00	CARBON	1K	5%	1/6W
R331	1-247-839-00	CARBON	2.2K	5%	1/6W
R332	1-247-879-00	CARBON	100K	5%	1/6W
R401	1-247-238-00	CARBON	820	5%	1/2W
R402	1-247-831-00	CARBON	1K	5%	1/6W
R403	1-247-871-00	CARBON	47K	5%	1/6W
R404	1-247-212-00	CARBON	68	5%	1/2W
R405	1-247-212-00	CARBON	68	5%	1/2W
R406	1-247-839-00	CARBON	2.2K	5%	1/6W
R407	1-247-867-00	CARBON	33K	5%	1/6W
R408	1-247-847-00	CARBON	4.7K	5%	1/6W
R409	1-247-811-00	CARBON	150	5%	1/6W
R410	1-247-823-00	CARBON	470	5%	1/6W
R411	1-247-815-00	CARBON	220	5%	1/6W
R412	1-247-815-00	CARBON	220	5%	1/6W
R413	1-247-819-00	CARBON	330	5%	1/6W
R414	1-247-855-00	CARBON	10K	5%	1/6W
R415	1-247-879-00	CARBON	100K	5%	1/6W
R416	1-247-863-00	CARBON	22K	5%	1/6W
R417	1-247-863-00	CARBON	22K	5%	1/6W
R418	1-247-855-00	CARBON	10K	5%	1/6W
R419	1-247-871-00	(TC-158R ONLY)...CARBON	47K	5%	1/6W
R420	1-247-847-00	(TC-158R ONLY)...CARBON	4.7K	5%	1/6W
R421	1-247-871-00	(TC-158R ONLY)...CARBON	47K	5%	1/6W
R422	1-247-879-00	(TC-158R ONLY)...CARBON	100K	5%	1/6W
R423	1-247-831-00	(TC-158R ONLY)...CARBON	1K	5%	1/6W
R424	1-247-879-00	(TC-158R ONLY)...CARBON	100K	5%	1/6W
R425	1-247-855-00	(TC-158R ONLY)...CARBON	10K	5%	1/6W
R426	1-247-859-00	CARBON	15K	5%	1/6W
R427	1-247-831-00	CARBON	1K	5%	1/6W
R428	1-247-831-00	CARBON	1K	5%	1/6W
R429	1-247-831-00	CARBON	1K	5%	1/6W
R430	1-247-831-00	CARBON	1K	5%	1/6W
R431	1-247-832-00	CARBON	1.1K	5%	1/6W
R432	1-247-835-00	CARBON	1.5K	5%	1/6W
R433	1-247-833-00	CARBON	1.2K	5%	1/6W
R434	1-247-831-00	CARBON	1K	5%	1/6W
R435	1-247-858-00	CARBON	13K	5%	1/6W
R436	1-247-846-00	CARBON	4.3K	5%	1/6W
R437	1-247-861-00	CARBON	18K	5%	1/6W
R438	1-247-795-00	CARBON	33	5%	1/6W
R439	1-247-855-00	CARBON	10K	5%	1/6W
R440	1-247-855-00	CARBON	10K	5%	1/6W
R441	1-247-857-00	CARBON	12K	5%	1/6W
R442	1-247-847-00	CARBON	4.7K	5%	1/6W
R443	1-247-809-00	CARBON	120	5%	1/6W
R444	1-247-833-00	CARBON	1.2K	5%	1/6W
R445	1-247-869-00	CARBON	39K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description
R446	1-247-873-00	CARBON 56K 5% 1/6W
R447 ⚠	1-212-865-91	FUSIBLE 22 5% 1/4W F
R448	1-247-839-00	CARBON 2.2K 5% 1/6W
R501	1-247-855-00	(TC-158R ONLY)...CARBON 10K 5% 1/6W
R502	1-247-903-00	(TC-158R ONLY)...CARBON 1M 5% 1/6W
R503	1-247-841-00	(TC-158R ONLY)...CARBON 2.7K 5% 1/6W
R504	1-247-879-00	(TC-158R ONLY)...CARBON 100K 5% 1/6W
R505	1-247-861-00	(TC-158R ONLY)...CARBON 18K 5% 1/6W
R506	1-247-847-00	(TC-158R ONLY)...CARBON 4.7K 5% 1/6W
R507	1-247-863-00	(TC-158R ONLY)...CARBON 22K 5% 1/6W
R601	1-247-809-00	CARBON 120 5% 1/6W
R602	1-247-855-00	CARBON 10K 5% 1/6W
R603	1-247-867-00	CARBON 33K 5% 1/6W
RV101	1-228-995-00	RES, ADJ, CARBON 22K
RV102	1-228-994-00	RES, ADJ, CARBON 10K
RV201	1-228-995-00	RES, ADJ, CARBON 22K
RV202	1-228-994-00	RES, ADJ, CARBON 10K
RY301	1-515-535-11	RELAY
S1	1-554-691-00	SWITCH, SLIDE (DOLBY NR)
S2	1-554-691-00	SWITCH, SLIDE (TIMER)
S3	1-514-674-31	SWITCH, SLIDE (DIRECTION)
S301	1-554-277-00	SWITCH, SLIDE (ISS)
S401	1-554-410-00	SWITCH, LEAF (RETRIGGER PROOF)
S601	1-553-856-00	SWITCH, KEY BOARD (STOP)
S602	1-553-856-00	SWITCH, KEY BOARD (REW)
S603	1-553-856-00	SWITCH, KEY BOARD (FF)
S604	1-553-856-00	SWITCH, KEY BOARD (FWD)
S605	1-553-856-00	SWITCH, KEY BOARD (REV)
S606	1-553-856-00	SWITCH, KEY BOARD (PAUSE)
S607	1-553-856-00	SWITCH, KEY BOARD (REC)
S608	1-553-856-00	SWITCH, KEY BOARD (REC MUTE)
S609	1-553-856-00	SWITCH, KEY BOARD (AMS)
S801	1-554-883-11	SWITCH, SLIDE (DIRECTION)
S802	1-553-856-00	SWITCH, KEY BOARD (HALF DET)
S803	1-553-856-00	SWITCH, KEY BOARD (70/120μ)
S804	1-553-856-00	SWITCH, KEY BOARD (METAL)
S805	1-553-856-00	SWITCH, KEY BOARD (ERASE PROOF/FWD)
S806	1-553-856-00	SWITCH, KEY BOARD (ERASE PROOF/REV)
SPK101	1-235-186-00	ENCAPSULATED COMPONENT
SPK201	1-235-186-00	ENCAPSULATED COMPONENT
T301	1-433-281-11	TRANSFORMER, BIAS OSCILLATOR
X501	1-527-532-00	(TC-158R ONLY)...OSCILLATOR, CERAMIC

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

SECTION 5

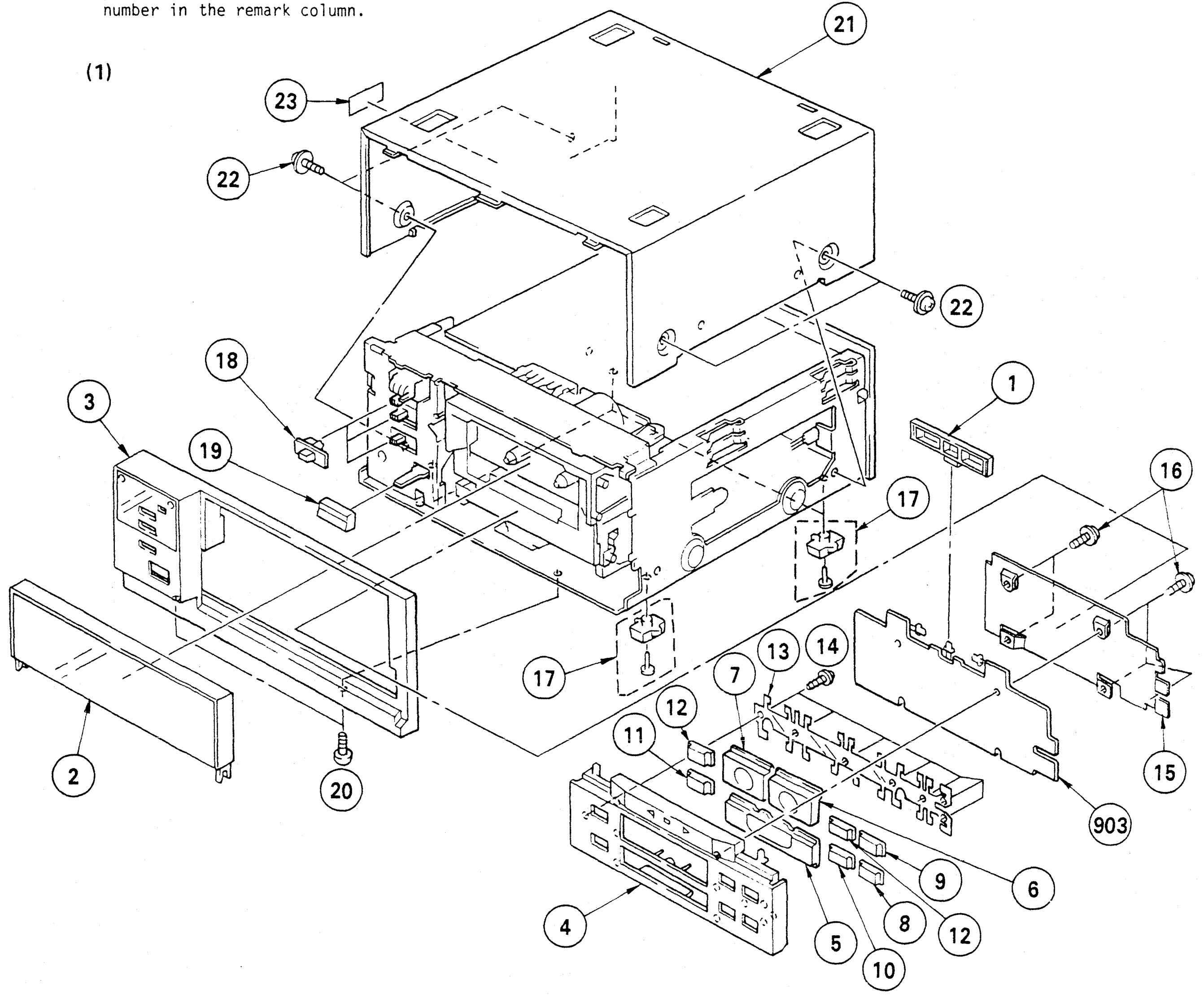
EXPLODED VIEWS AND PARTS LIST

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since' they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

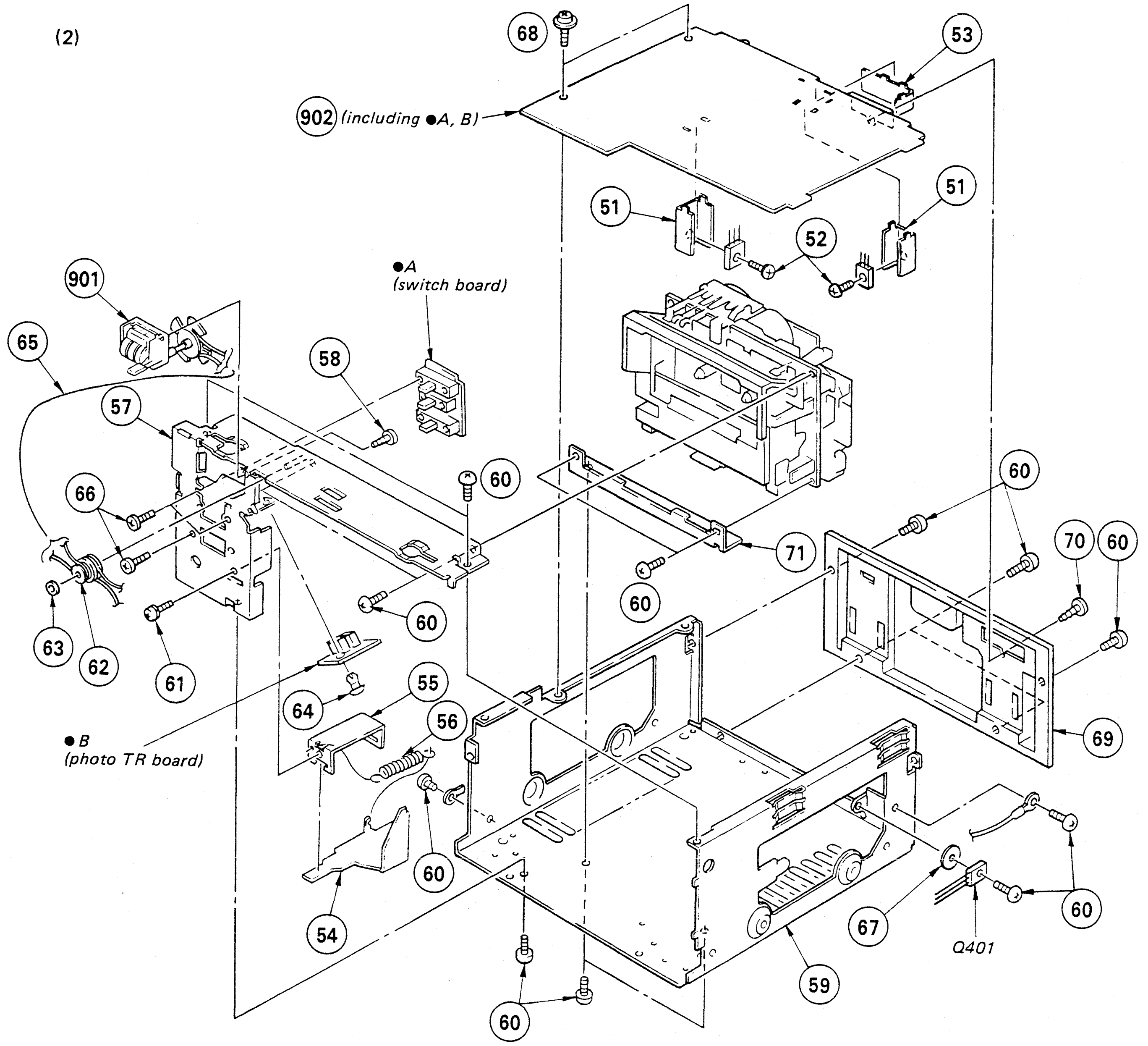
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

(1)



No.	Part No.	Description	Remarks
1	*3-325-508-01	HOUSE, LED	
2	X-3325-508-1	(TC-118:SILVER)....CASSETTE WINDOW ASSY	
	X-3325-509-1	(TC-118:BLACK).....CASSETTE WINDOW ASSY	
	X-3325-512-1	(TC-158R:SILVER)...CASSETTE WINDOW ASSY	
	X-3325-513-1	(TC-158R:BLACK)....CASSETTE WINDOW ASSY	
3	X-3325-514-1	(SILVER)...FRONT PANEL ASSY	
	X-3325-515-1	(BLACK)....FRONT PANEL ASSY	
4	X-3325-510-1	(SILVER)...ESCUTCHEON ASSY	
	X-3325-511-1	(BLACK)....ESCUTCHEON ASSY	
5	3-325-506-01	(BLACK)....BUTTON (B), STOP	
	3-325-506-11	(SILVER)...BUTTON (S), STOP	
6	3-325-504-01	(BLACK)....BUTTON (B), FWD	
	3-325-504-11	(SILVER)...BUTTON (S), FWD	
7	3-325-505-01	(BLACK)....BUTTON (B), REV	
	3-325-505-11	(SILVER)...BUTTON (S), REV	
8	3-325-503-31	(BLACK)....BUTTON (B), REC MUTE	
	3-325-503-71	(SILVER)...BUTTON (S), REC MUTE	
9	3-325-503-11	BUTTON, REC	
10	3-325-503-21	(BLACK)....BUTTON (B), PAUSE	
	3-325-503-61	(SILVER)...BUTTON (S), PAUSE	
11	3-325-503-41	BUTTON, AMS	
12	3-325-503-01	(BLACK)....BUTTON (B), FF.REW	
	3-325-503-51	(SILVER)...BUTTON (S), FF.REW	
13	3-325-512-01	SPRING	
14	7-687-202-11	TOTSU, TAPPING PTPWH 2X4	
15	*3-325-511-01	PLATE, SHIELD	
16	7-687-233-11	SCREW, TOTSU PTPWH 2.6X6,TYPE2	
17	X-4902-937-1	FOOT ASSY, RUBBER	
18	3-307-538-21	(BLACK)....KNOB, SWITCH, TIMER	
	3-307-538-61	(SILVER)...KNOB, SWITCH, TIMER	
19	3-575-533-00	(SILVER)...BUTTON, EJECT	
	3-575-533-31	(BLACK)....BUTTON, EJECT	
20	7-685-871-01	SCREW +BVTT 3X6 (S)	
21	4-910-078-21	(SILVER)...CASE	
	4-910-078-31	(BLACK)....CASE	
22	4-886-821-01	(BLACK)....SCREW, M3 CASE	
	4-886-821-11	(SILVER)...SCREW, M3 CASE	
23	*3-325-516-01	(TC-118)....LABEL, MODEL NUMBER (W)	
	*3-325-521-01	(TC-158R)...LABEL, MODEL NUMBER (W)	
903	*1-615-390-11	PC BOARD, CONTROL SWITCH	

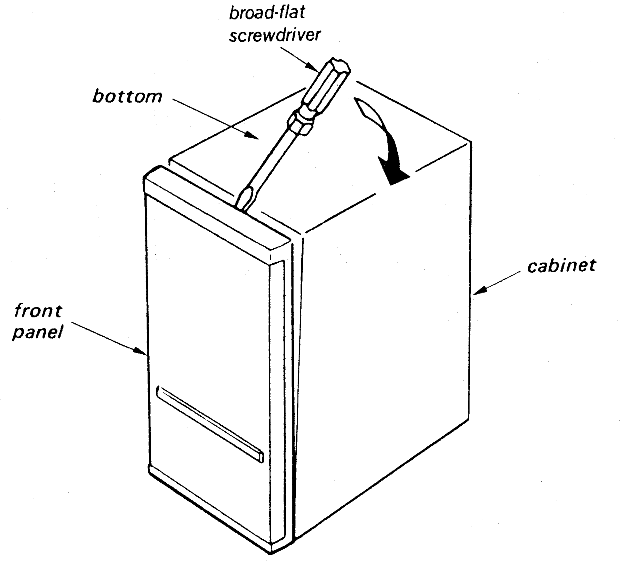
(2)


68
53
902 (including ●A, B)
51
51
52
●A
(switch board)
901
65
58
57
60
66
60
71
70
60
60
60
63
62
61
64
55
56
●B
(photo TR board)
69
60
54
67
Q401
60
59
60

No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
51	*3-312-615-31	HEAT SINK		63	3-558-708-21	WASHER, STOPPER	
52	7-685-871-01	SCREW +BVTT 3X6 (S)		64	4-812-134-11	RIVET NYLON, 3.5	
53	*3-325-515-01	PLATE, SHIELD		65	3-325-509-01	BELT (A), SQUARE	
54	*3-325-513-01	SLIDER, EJECT		66	7-621-775-10	SCREW +B 2.6X4	
55	*3-575-502-00	BRACKET, EJECT		67	3-572-365-11	SHEET, INSULATING (A)	
56	3-534-238-XX	SPRING, TENSION		68	3-703-249-01	SCREW, S TIGHT, +PTTWH 3X6	
57	X-3325-501-1	CHASSIS ASSY, JOINT		69	3-309-129-71	PLATE, JACK	
58	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S		70	7-685-647-71	SCREW +BVTP 3X10 TYPE2 SLIT	
59	*3-309-132-12	CHASSIS		71	*3-319-722-01	BRACKET, MD	
60	7-685-871-01	SCREW +BVTT 3X6 (S)		901	1-548-563-91	COUNTER, TAPE (MIDDLE TYPE)	
61	7-628-254-05	SCREW +PS 2.6X5		902	*A-2056-270-A	(TC-118)....MOUNTED PCB, AUDIO	
62	3-318-825-01	PULLEY, MIDWAY			*A-2056-271-A	(TC-158R)...MOUNTED PCB, AUDIO	

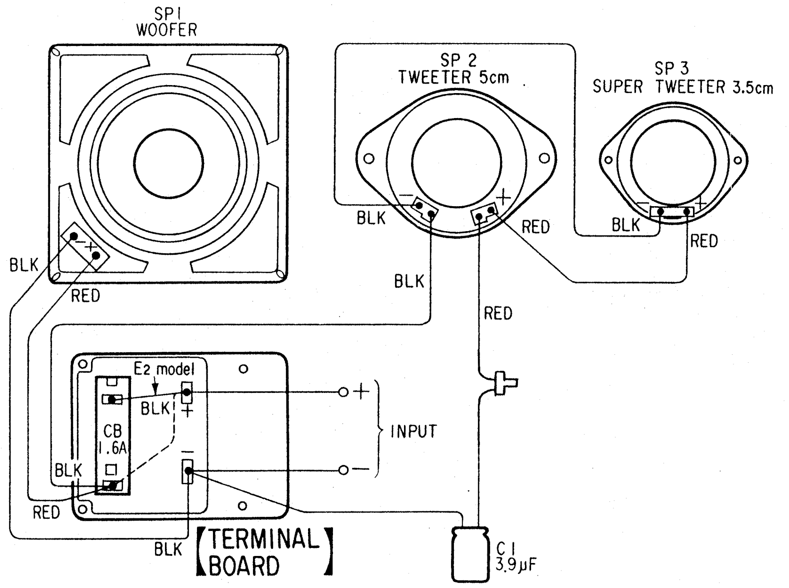
SPEAKER SYSTEM
〔APM-158〕

1. DISASSEMBLY
FRONT PANEL REMOVAL

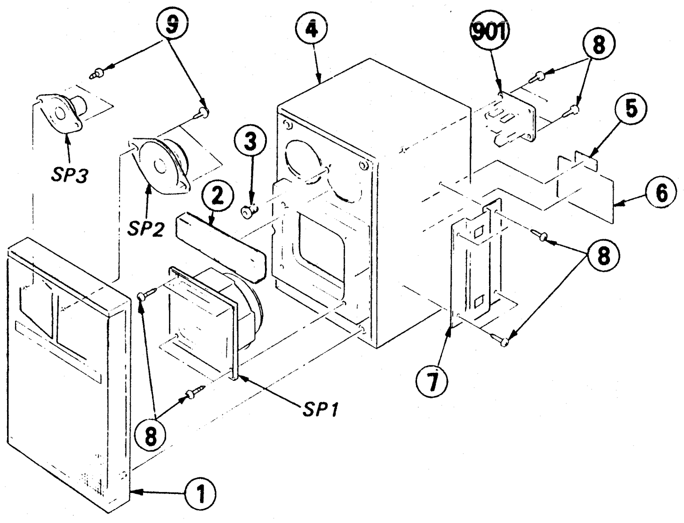

broad-flat screwdriver
bottom
cabinet
front panel

Note: Be careful not to scratch the cabinet.

2. WIRING DIAGRAM


SP1 WOOFER
SP 2 TWEETER 5cm
SP 3 SUPER TWEETER 3.5cm
BLK
RED
BLK
RED
BLK
RED
BLK
RED
BLK
RED
E2 model
BLK
+
CB 1.6A
BLK
RED
+
−
INPUT
BLK
TERMINAL BOARD
C1 3.9μF

3. EXPLODED VIEW AND PARTS LIST


9
4
901
8
5
3
SP3
SP2
2
6
8
8
7
SP1
8
1

No.	Part No.	Description	REMARKS
1	X-4910-011-1	(SILVER)...PANEL (LEFT) ASSY, FRONT	
	X-4910-010-1	(BLACK)....PANEL (RIGET) ASSY, FRONT	
	X-4910-009-1	(BLACK)....PANEL (LEFT) ASSY, FRONT	
	X-4910-012-1	(SILVER)...PANEL (RIGET) ASSY, FRONT	
2	*4-910-045-01	ABSORBENT (C), ACOUSTIC	
3	4-910-041-01	CLAMP	
4	X-4910-007-1	(SILVER)...CABINET ASSY, SPEAKER	
	X-4910-008-1	(BLACK)....CABINET ASSY, SPEAKER	
	X-4910-039-1	(DENMARK)...CABINET ASSY, SPEAKER	
5	*4-910-024-01	LABEL, MODEL NUMBER	
	*4-910-025-01	(E2)...LABEL, MODEL NUMBER	
6	*4-875-621-01	LABEL, CAUTION	
7	*4-902-981-01	(SILVER)...PLATE (B), SIDE	
	*4-902-981-11	(BLACK)....PLATE (B), SIDE	
8	4-874-614-11	SCREW (4)(3.5X14), TAPPING	
9	7-685-646-71	SCREW +BVTP 3X8 TYPE 2, SLIT	

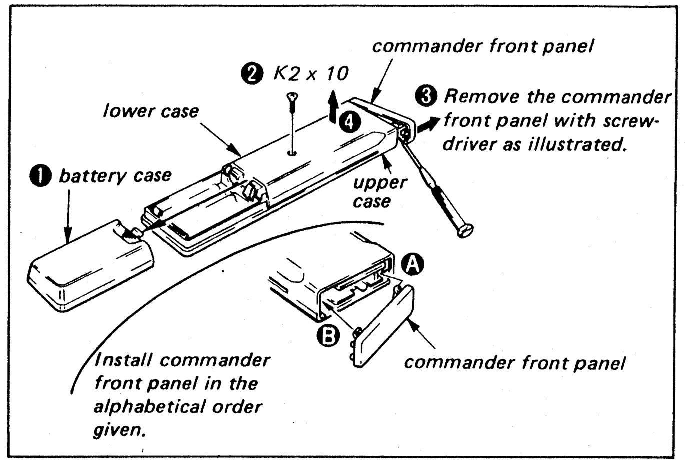
ELECTRICAL PARTS

Ref.No.	Part No.	Description
901	1-536-900-11	TERMINAL BOARD, SPEAKER
C1	1-123-547-11	CAP, ELECT(NONPOLAR)3.9MF 20% 50V
CB	1-532-661-11	(E2)...CIRCUIT BREAKER 1.6A
SP1	8-927-207-00	SPEAKER APM (WOOFER)
SP2	1-503-467-11	SPEAKER, CONE (LEFT)(TWEETER) 5CM
SP2	1-503-468-11	SPEAKER, CONE (RIGHT)(TWEETER) 5CM
SP3	1-503-461-21	SPEAKER, CONE (SUPER TWEETER) 3.5CM

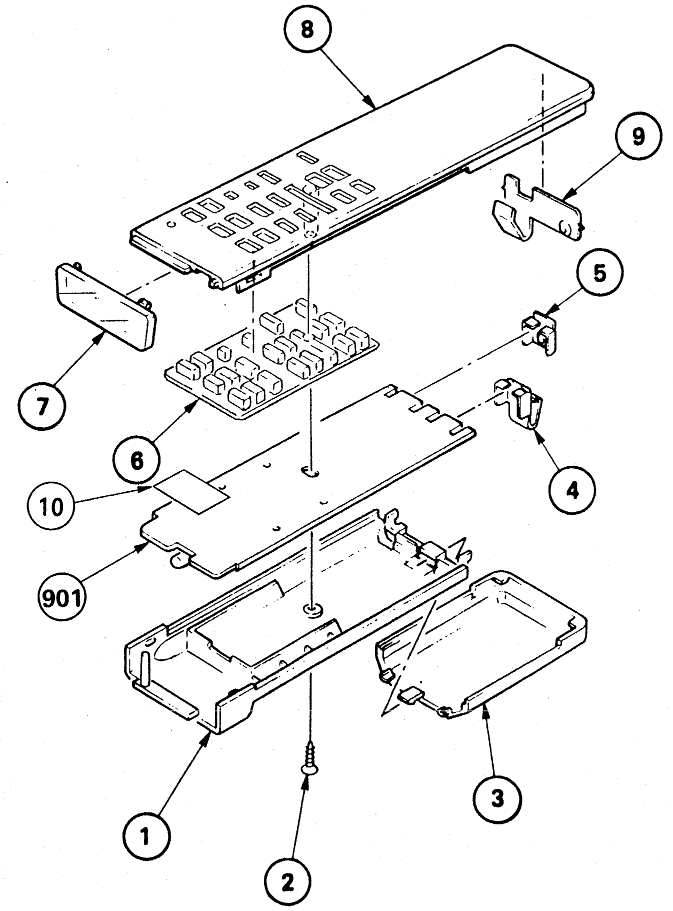
NOTE:
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

REMOTE CONTROL UNIT
〔RM-158〕

1. DISASSEMBLY


commander front panel
❷ K2 x 10
lower case
❸ Remove the commander front panel with screw-driver as illustrated.
❹
❶ battery case
upper case
Ⓐ
Ⓑ
commander front panel
Install commander front panel in the alphabetical order given.

2. EXPLODED VIEW


8
9
5
7
4
6
10
901
3
1
2

3. ELECTRICAL PARTS LIST

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	*1-615-064-11	PC BOARD			
C1	1-123-647-00	ELECT	47MF	20%	6.3V
C2	1-102-106-00	CERAMIC	100PF	10%	50V
C3	1-102-106-00	CERAMIC	100PF	10%	50V
D1	8-719-107-82	DIODE SE303AY			
D2	8-719-100-06	DIODE SR106C			
D3	8-719-815-55	DIODE 1S1555			
D4	8-719-815-55	DIODE 1S1555			
D5	8-719-815-55	DIODE 1S1555			
D6	8-719-815-55	DIODE 1S1555			
D7	8-719-815-55	DIODE 1S1555			
D8	8-719-815-55	DIODE 1S1555			
IC1	8-759-902-22	IC CX7947			
IC2	8-759-200-67	IC TC4001BF			
IC3	8-759-200-84	IC TC4081BF			
Q1	8-729-271-02	TRANSISTOR 2SC2710			
R1	1-247-809-00	CARBON	120	5%	1/6W
R2	1-246-401-00	CARBON	1	1%	1/4W
R3	1-247-825-00	CARBON	560	5%	1/6W
R4	1-247-879-00	CARBON	100K	5%	1/6W
R5	1-247-879-00	CARBON	100K	5%	1/6W
R6	1-247-879-00	CARBON	100K	5%	1/6W
R7	1-247-879-00	CARBON	100K	5%	1/6W
R8	1-247-879-00	CARBON	100K	5%	1/6W
X1	1-527-476-00	OSCILLATOR, CERAMIC 480kHz			

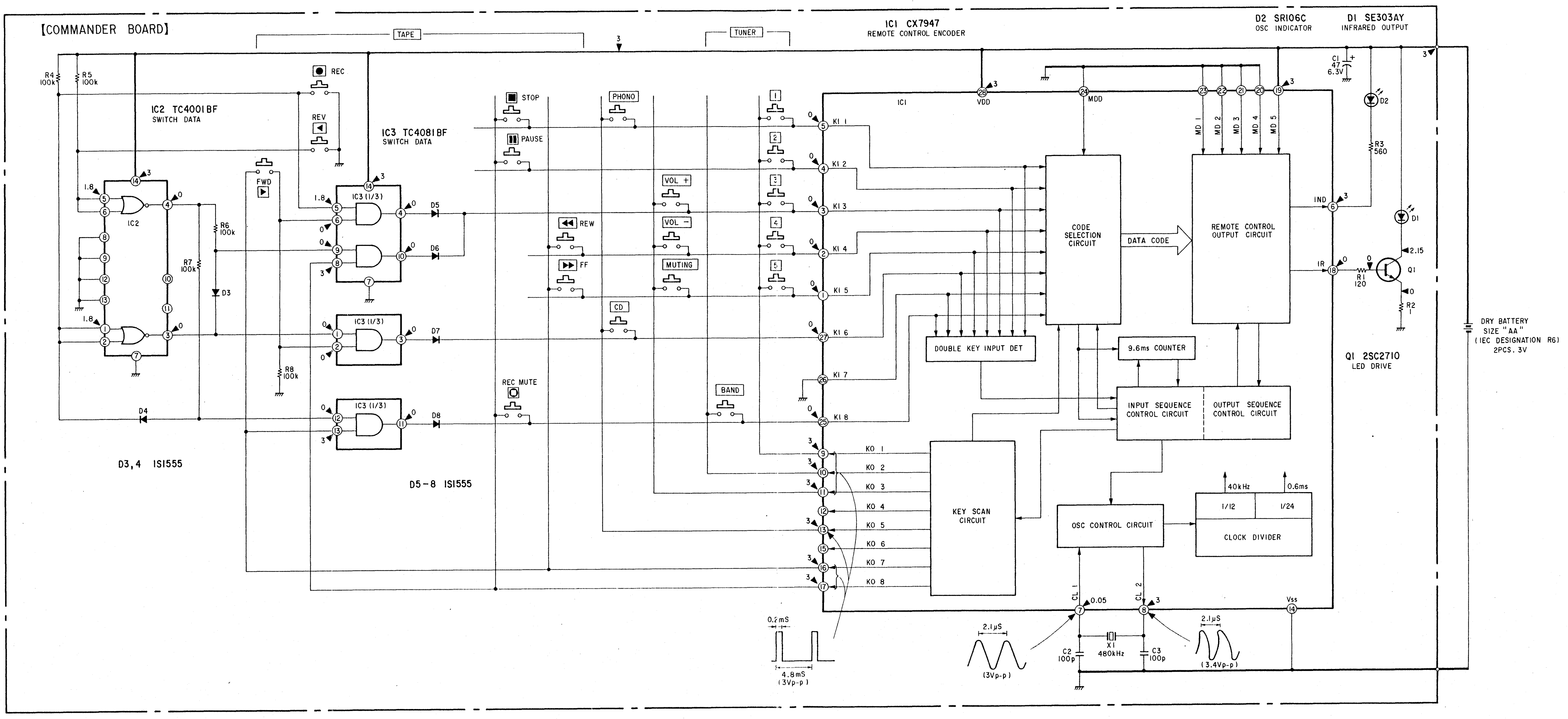
No.	Part No.	Description
1	2-354-408-01	CASE (LOWER)
2	7-685-206-14	SCREW +KTP 2X10 TYPE 2 NON-SLIT
3	2-354-405-01	CASE, BATTERY
4	4-370-638-01	TERMINAL (B), BATTERY
5	4-370-637-01	TERMINAL (A), BATTERY
6	9-987-144-01	RUBBER, CONTACT
7	2-354-411-01	PANEL, FRONT, COMMANDER
8	9-987-143-01	CASE (UPPER) ASSY
9	4-350-925-11	TERMINAL (C), BATTERY
10	9-911-863-XX	INSULATOR

NOTE:
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.

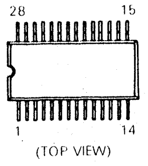
4. SCHEMATIC DIAGRAM



[COMMANDER BOARD]
TAPE
TUNER
IC1 CX7947
REMOTE CONTROL ENCODER
D2 SR106C
OSC INDICATOR
D1 SE303AY
INFRARED OUTPUT
IC2 TC4001BF
SWITCH DATA
IC3 TC4081BF
SWITCH DATA
R4 100k
R5 100k
R6 100k
R7 100k
R8 100k
D3
D4
D5
D6
D7
D8
REC
REV
FWD
STOP
PAUSE
REW
FF
REC MUTE
PHONO
CD
VOL +
VOL −
MUTING
BAND
KI 1
KI 2
KI 3
KI 4
KI 5
KI 6
KI 7
KI 8
KO 1
KO 2
KO 3
KO 4
KO 5
KO 6
KO 7
KO 8
VDD
MDD
MD 1
MD 2
MD 3
MD 4
MD 5
CODE SELECTION CIRCUIT
DATA CODE
REMOTE CONTROL OUTPUT CIRCUIT
DOUBLE KEY INPUT DET
9.6ms COUNTER
INPUT SEQUENCE CONTROL CIRCUIT
OUTPUT SEQUENCE CONTROL CIRCUIT
KEY SCAN CIRCUIT
OSC CONTROL CIRCUIT
CLOCK DIVIDER
1/12
1/24
40kHz
0.6ms
IND
IR
CL 1
CL 2
Vss
C1 47 6.3V
R3 560
R1 120
R2 1
Q1
C2 100p
C3 100p
X1 480kHz
0.2mS
4.8mS (3Vp-p)
2.1μS (3Vp-p)
2.1μS (3.4Vp-p)
0.05
2.15
DRY BATTERY SIZE "AA" (IEC DESIGNATION R6) 2PCS. 3V
Q1 2SC2710
LED DRIVE
D3,4 IS1555
D5−8 IS1555

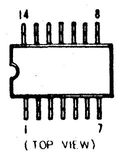
- **Semiconductor Lead Layouts**

CX7947



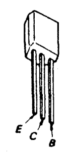
(TOP VIEW)

TC4001BF
TC4081BF

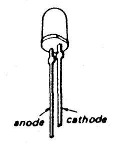


(TOP VIEW)

2SC2710

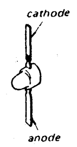


SE303AY



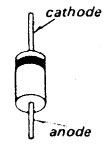
anode
cathode

SR106C



cathode
anode

1S1555

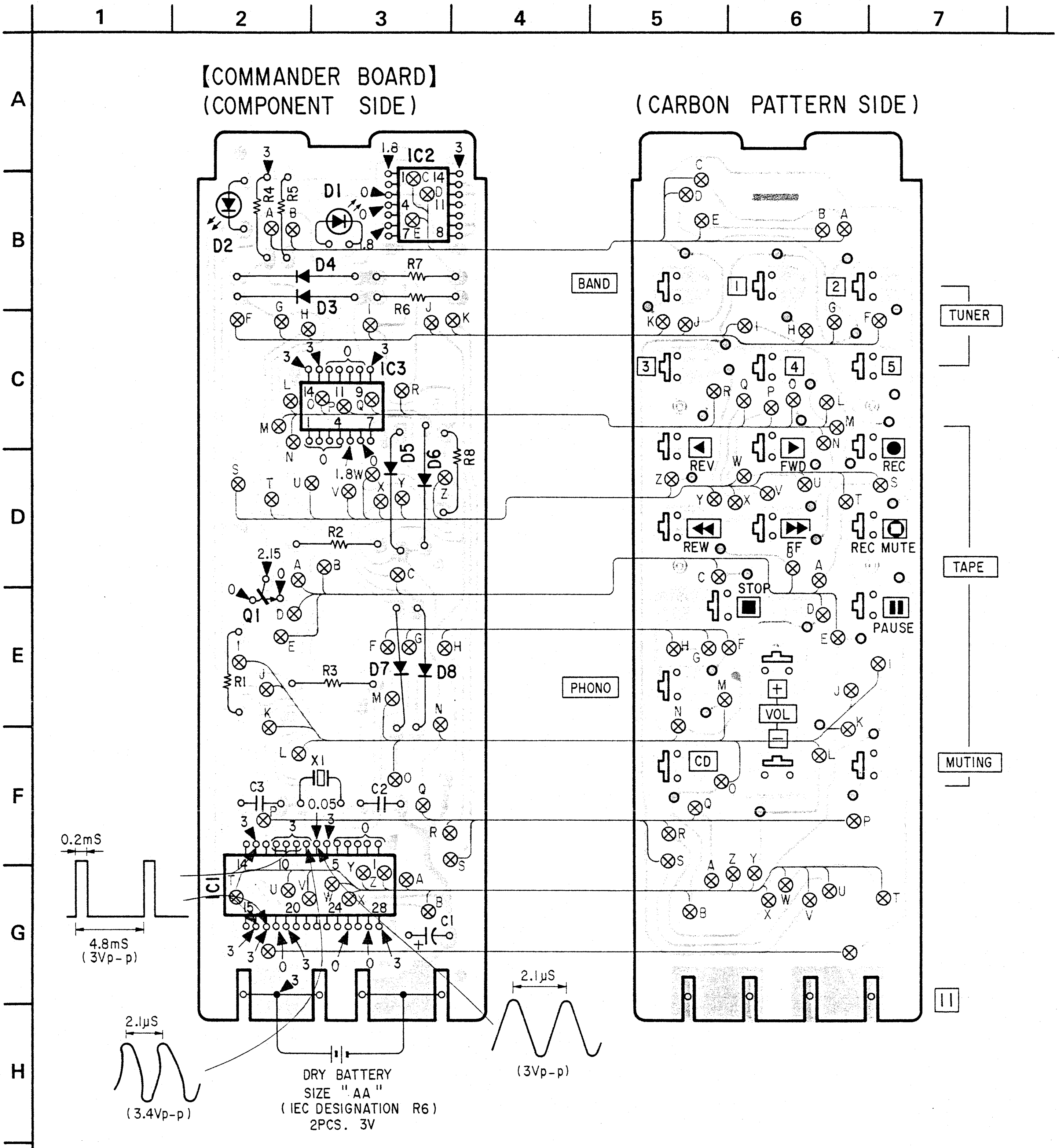


cathode
anode

Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- ▬ : B+ bus.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- Readings are taken under no-signal conditions with a VOM (50 kΩ/V).
  no mark : key switch OFF mode
  ( ) : key switch ON mode

5. MOUNTING DIAGRAM


1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
J
【COMMANDER BOARD】
(COMPONENT SIDE)
(CARBON PATTERN SIDE)
IC1
IC2
IC3
D1
D2
D3
D4
D5
D6
D7
D8
Q1
R1
R2
R3
R4
R5
R6
R7
R8
C1
C2
C3
X1
BAND
PHONO
TUNER
TAPE
MUTING
REV
FWD
REC
REW
FF
REC MUTE
STOP
PAUSE
VOL
CD
1
2
3
4
5
11
1.8
3
2.15
0.05
1.8W
0.2mS
4.8mS
(3Vp-p)
2.1μS
(3.4Vp-p)
2.1μS
(3Vp-p)
DRY BATTERY
SIZE "AA"
(IEC DESIGNATION R6)
2PCS. 3V

Note:

- ⊗ : Through hole.
- ○ : connecting point of conductor side pattern and carbon pattern.
- ▨ : B + pattern
- ▨ : carbon pattern
- —— : Through hole connection

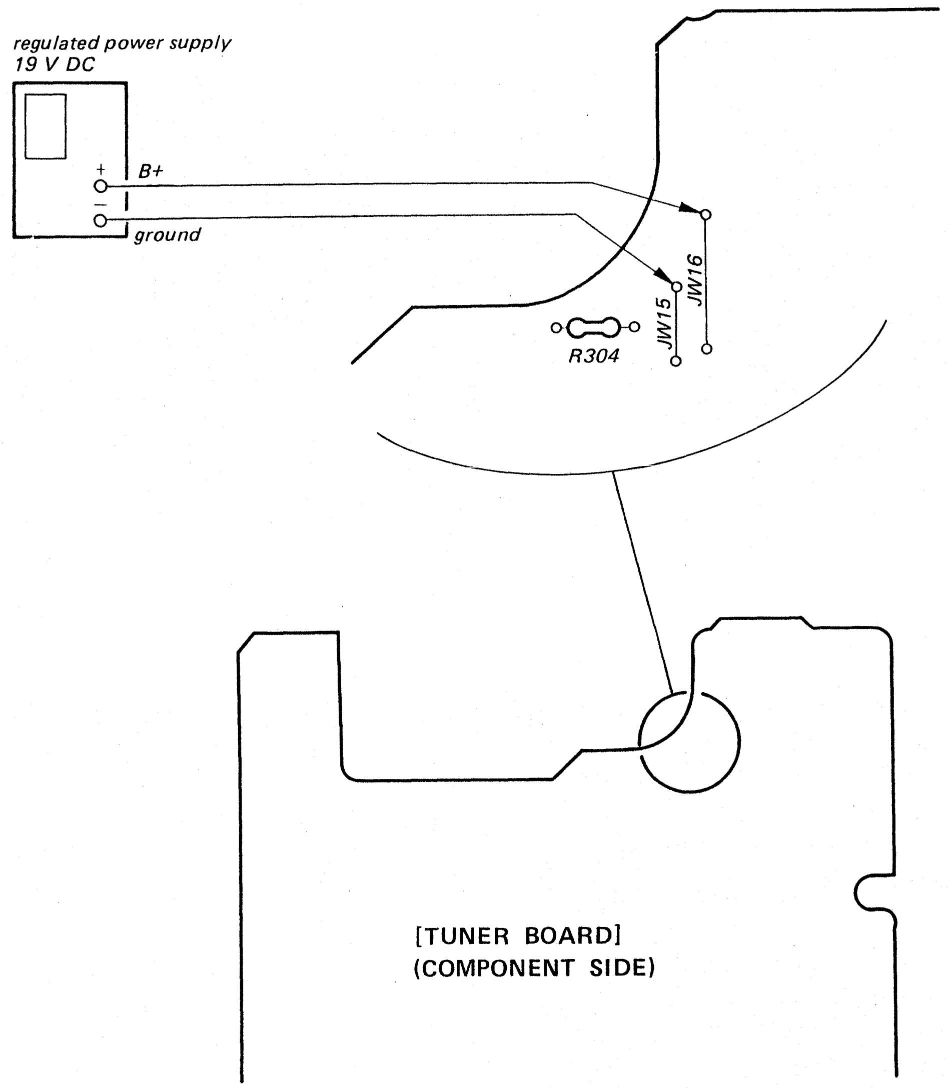
FM STEREO/FM-AM TUNER
〔ST-118/158〕

REPAIRING PRECAUTION

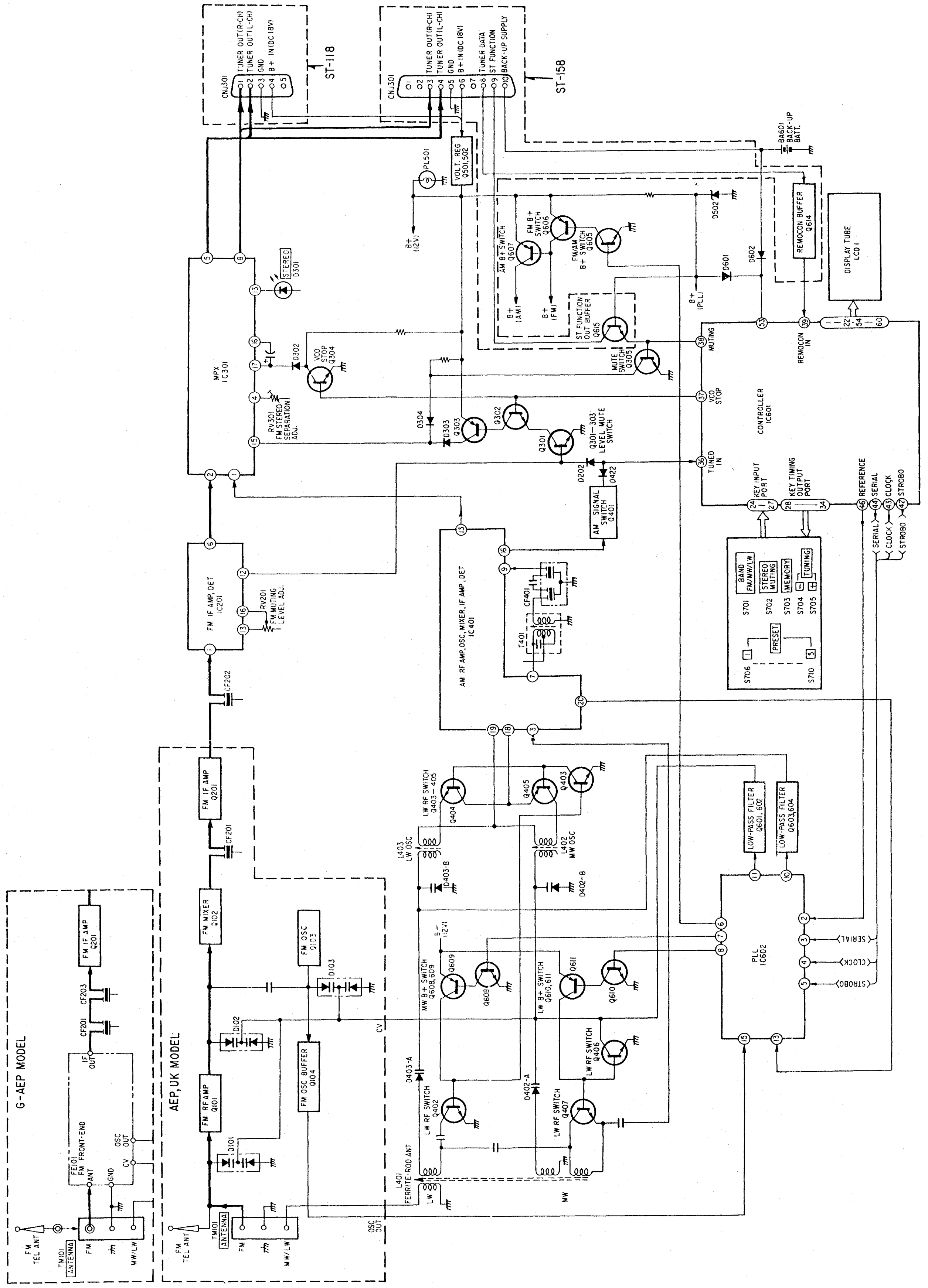
[To apply B+ voltage]

The power of this unit is fed from TA-118 or TA-158.

Because of this, connect the regulated power supply as illustrated below when this unit alone operates.


regulated power supply
19 V DC
+
B+
−
ground
JW15
JW16
R304
[TUNER BOARD]
(COMPONENT SIDE)

SECTION 1
BLOCK DIAGRAM


ST-118
ST-158
CN301
TUNER OUT(R-CH)
TUNER OUT(L-CH)
GND
B+ IN(DC 18V)
TUNER DATA
ST FUNCTION
BACK-UP SUPPLY
VOLT REG Q501,502
PL501
B+ (12V)
STEREO D301
MPX IC301
VCO STOP Q304
RV301 FM STEREO SEPARATION ADJ.
Q301-303 LEVEL MUTE SWITCH
FM IF AMP, DET IC201
RV201 FM MUTING LEVEL ADJ.
CF202
AM SIGNAL SWITCH Q401
AM RF AMP, OSC, MIXER, IF AMP, DET IC401
CF401
F401
AM B+ SWITCH Q607
FM B+ SWITCH Q606
FM/AM B+ SWITCH Q605
ST FUNCTION OUT BUFFER Q615
MUTE SWITCH Q612
REMOCON BUFFER Q614
DISPLAY TUBE LCD1
BA601 BACK-UP BATT.
D601
D602
CONTROLLER IC601
MUTING
VCO STOP
TUNED IN
REMOCON IN
KEY INPUT PORT
KEY TIMING OUTPUT PORT
REFERENCE
SERIAL CLOCK
STROBO
SERIAL
CLOCK
STROBO
S701 BAND FM/MW/LW
S702 STEREO/MUTING
S703 MEMORY
S704 TUNING +
S705 TUNING −
S706
PRESET
S710
LOW-PASS FILTER Q601,602
LOW-PASS FILTER Q603,604
PLL IC602
LW RF SWITCH Q403-405
L403 LW OSC
L402 MW OSC
MW B+ SWITCH Q608,609
LW B+ SWITCH Q610,611
LW RF SWITCH Q402
LW RF SWITCH Q407
L401 FERRITE-ROD ANT
MW
LW
FM IF AMP Q201
CF201
FM MIXER Q102
FM OSC Q103
FM OSC BUFFER Q104
FM RF AMP Q101
D101
D102
D103
CV
OSC OUT
AEP, UK MODEL
G-AEP MODEL
FE101 FM FRONT-END
CF203
TM101 ANTENNA
FM TEL ANT
FM
MW/LW

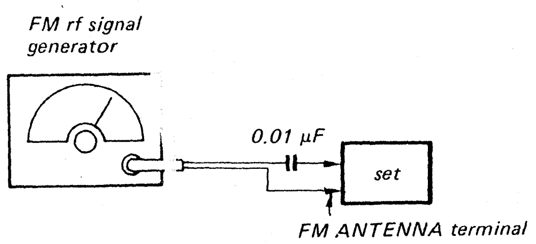
SECTION 2
ADJUSTMENTS

FM SECTION

Setting:
BAND selector switch . . . . FM

FM OSC Voltage Adjustment

Setting:

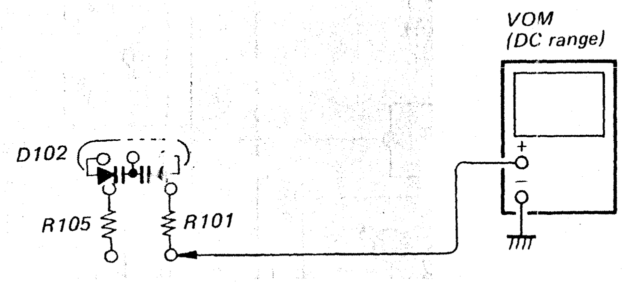

FM rf signal generator
0.01 μF
set
FM ANTENNA terminal

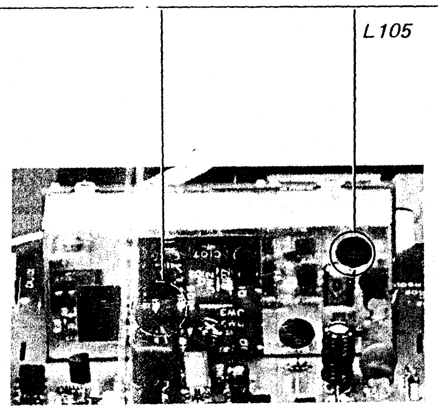
Carrier frequency: *108 MHz*
Modulation: *1 kHz, 75 kHz deviation*
Output level: *as low as possible*

Procedure:

1. Push the TUNING (+, –) button for 108 MHz.
2. Adjust L105 for 8.9 – 9 V reading on the VOM.

[FE BOARD] (CONDUCTOR SIDE)


VOM
(DC range)
D102
R105
R101

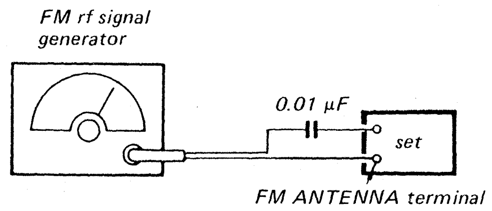


FE board

G-AEP Model:
The FM front-end is carefully adjusted at the factory and is supplied as one whole block for replacement.

FM Tracking Adjustment (Except for G-AEP model)

Setting:

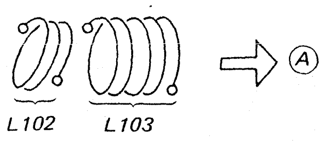

FM rf signal generator
0.01 μF
set
FM ANTENNA terminal

Carrier frequency: *98 MHz*
Modulation: *1 kHz, 75 kHz deviation*
Output level: *3.16 μV (10 dB)*

Procedure:

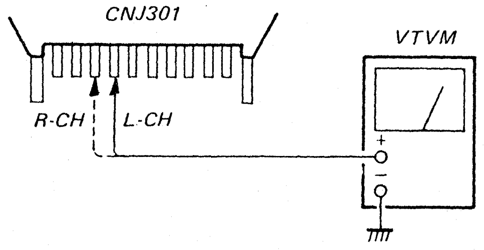
1. Push TUNING (+, –) button for 98 MHz.
2. Approach L102 and L103 not to contact each other.
3. Adjust L101 and L103, and repeat the adjustment 2 – 3 times for maximum VTVM reading.

(Adjust L103 in the direction as shown by arrow Ⓐ.)

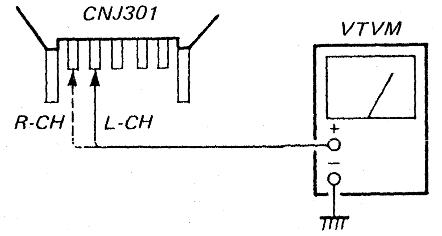


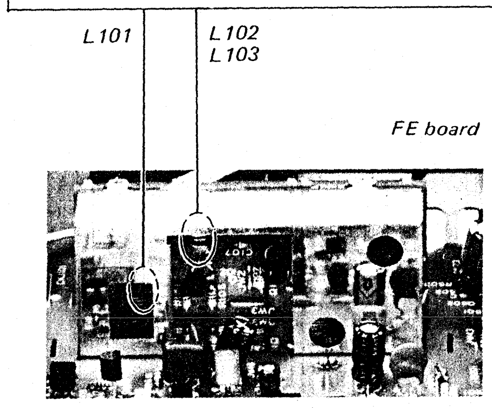
Note: Do not touch L102.

– ST-158 –


CNJ301
VTVM
R-CH
L-CH
+
–

– ST-118 –


CNJ301
VTVM
R-CH
L-CH
+
–

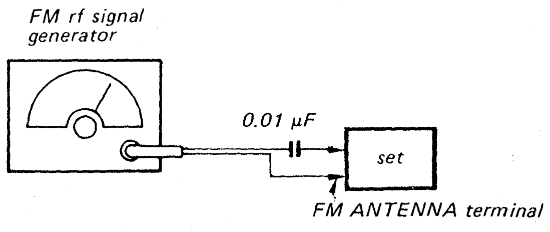

L101
L102
L103

FE board

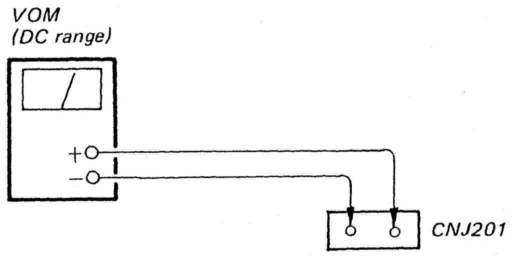
Note: FM discriminator alignment should be mode after FM tracking adjustment.

FM Discriminator Alignment (NULL Check)

Setting:


FM rf signal generator
0.01 μF
set
FM ANTENNA terminal

Carrier frequency: *98 MHz*
Modulation: *1 kHz, 75 kHz deviation (AEP, UK model)*
1 kHz, 40 kHz deviation (G-AEP model)
Output level: *1 mV (60 dB)*


VOM
(DC range)
+
–
CNJ201

Procedure:

1. Push the TUNING (+, –) button for 98 MHz.
2. Adjust T201 for 0 V reading on the VOM.

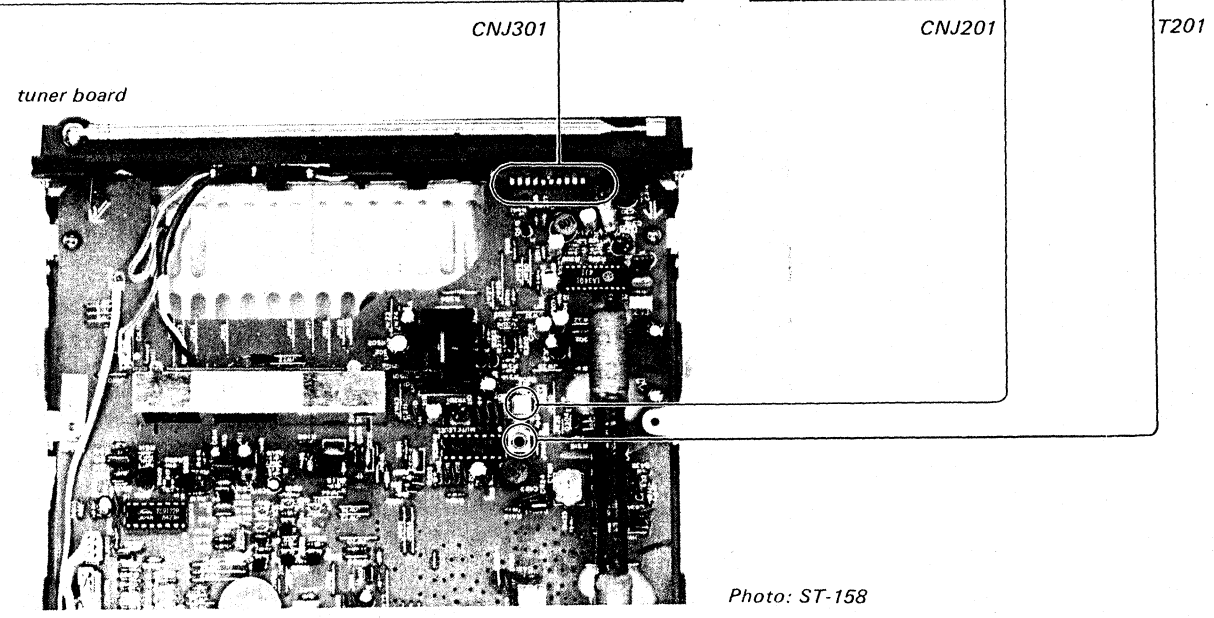
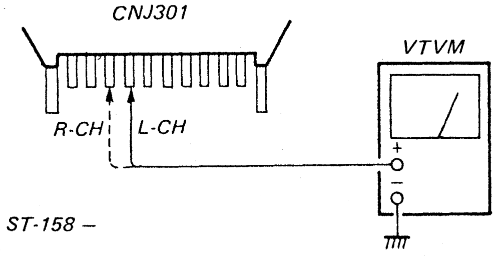
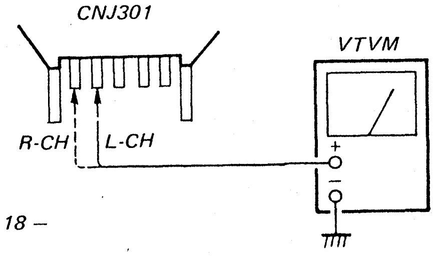

CNJ301
CNJ201
T201
tuner board

Photo: ST-158

FM SECTION 2


CNJ301
VTVM
R-CH
L-CH
+
–

– ST-158 –


CNJ301
VTVM
R-CH
L-CH
+
–

– ST-118 –

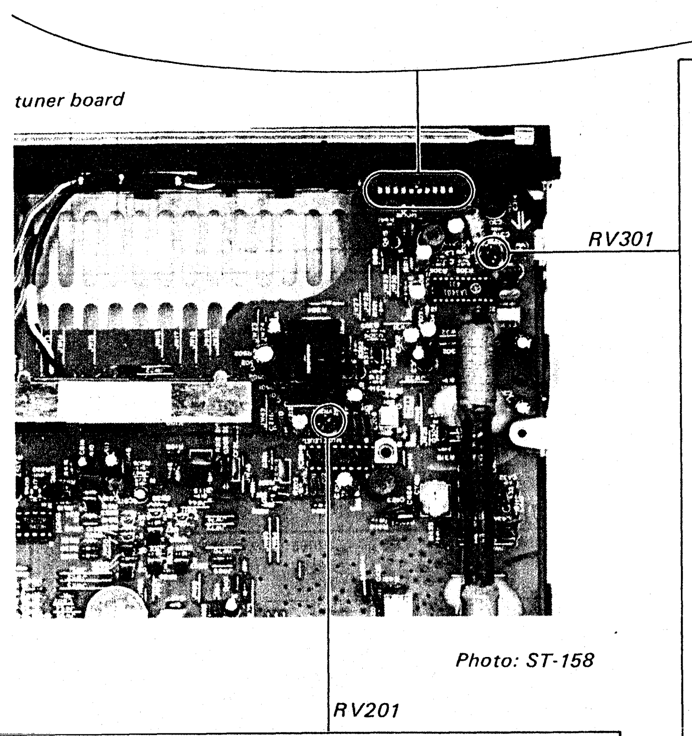

tuner board
RV301
RV201

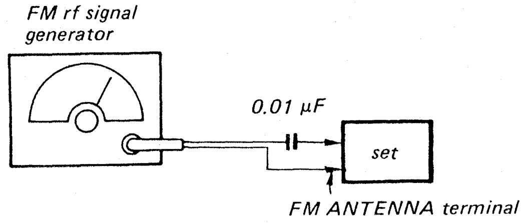
Photo: ST-158

FM Muting Level Adjustment

Setting:

STEREO MUTING switch . . . . ON

Procedure:


FM rf signal generator
0.01 µF
set
FM ANTENNA terminal

Carrier frequency: 98 MHz
Modulation: 1 kHz, 75 kHz deviation (AEP, UK model)
1 kHz, 40 kHz deviation (G-AEP model)
Output level: 17.9 µV (25 dB)

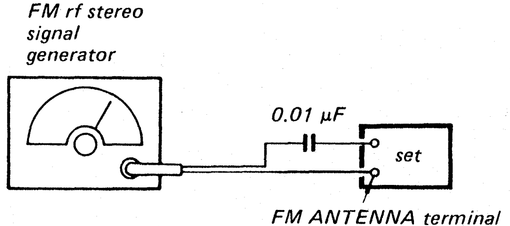
1. Push the TUNING (+, –) button for 98 MHz.
2. Adjust RV201 for a point the VTVM reading just drops to 0 V.

FM Stereo Separation Adjustment

Setting:

STEREO MUTING switch . . . . ON

Procedure:


FM rf stereo signal generator
0.01 µF
set
FM ANTENNA terminal

Carrier frequency: 98 MHz
Modulation: audio (1 kHz):
33.75 kHz deviation (AEP, UK model)
20 kHz deviation (G-AEP model)
pilot (19 kHz): 7.5 kHz deviation
sub-channel (38 kHz):
33.75 kHz deviation (AEP, UK model)
20 kHz deviation (G-AEP model)
Output level: 1 mV (60 dB)
Mode: stereo

FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RV301 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RV301 for minimum reading.

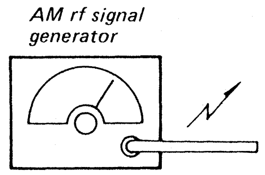
L-CH Stereo separation: Ⓐ – Ⓑ
R-CH Stereo separation: Ⓒ – Ⓓ

The separations of both channels should be equal.

AM SECTION

Setting:

BAND selector switch: MW or LW

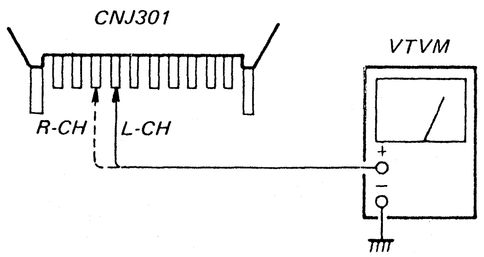

AM rf signal generator

Put the lead-wire antenna close to the set.

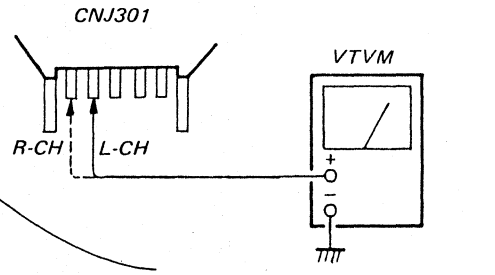
30% amplitude modulation by 400 Hz signal

- Repeat the procedures in each adjustment several times, and the OSC voltage and tracking adjustments should be finally done by the timmer capacitors.

– ST-158 –


CNJ301
VTVM
R-CH
L-CH
+
–

– ST-118 –


CNJ301
VTVM
R-CH
L-CH
+
–

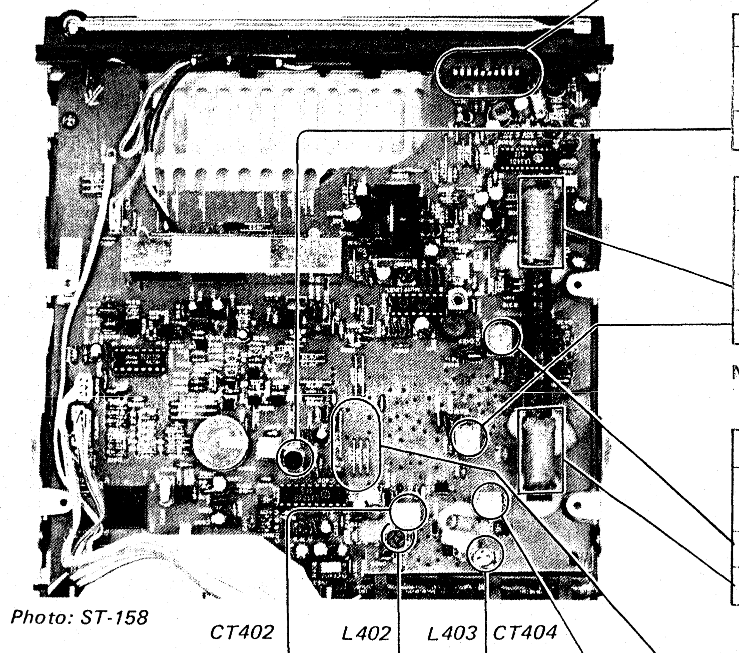

CT402
L402
L403
CT404

Photo: ST-158

AM IF ALIGNMENT	
Adjust for a maximum reading on VTVM.	
T401	450 kHz

LW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
L401	170 kHz
CT403	310 kHz

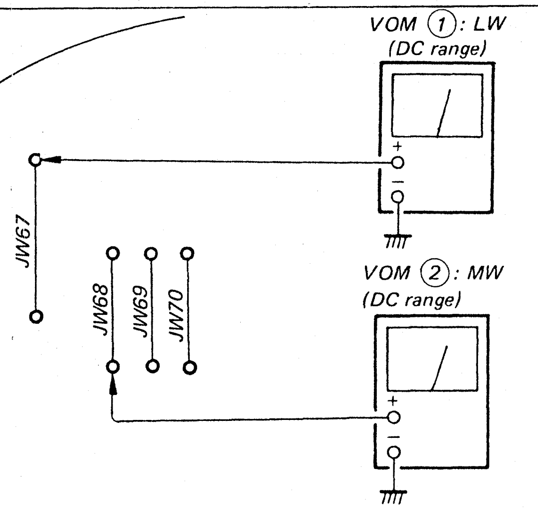
Note: MW tracking adjustment should be made after LW tracking adjustment.

MW TRACKING ADJUSTMENT	
Adjust for a maximum reading on VTVM.	
CT401	1,404 kHz
L401	603 kHz

MW/LW OSC Voltage Adjustment

Procedure:

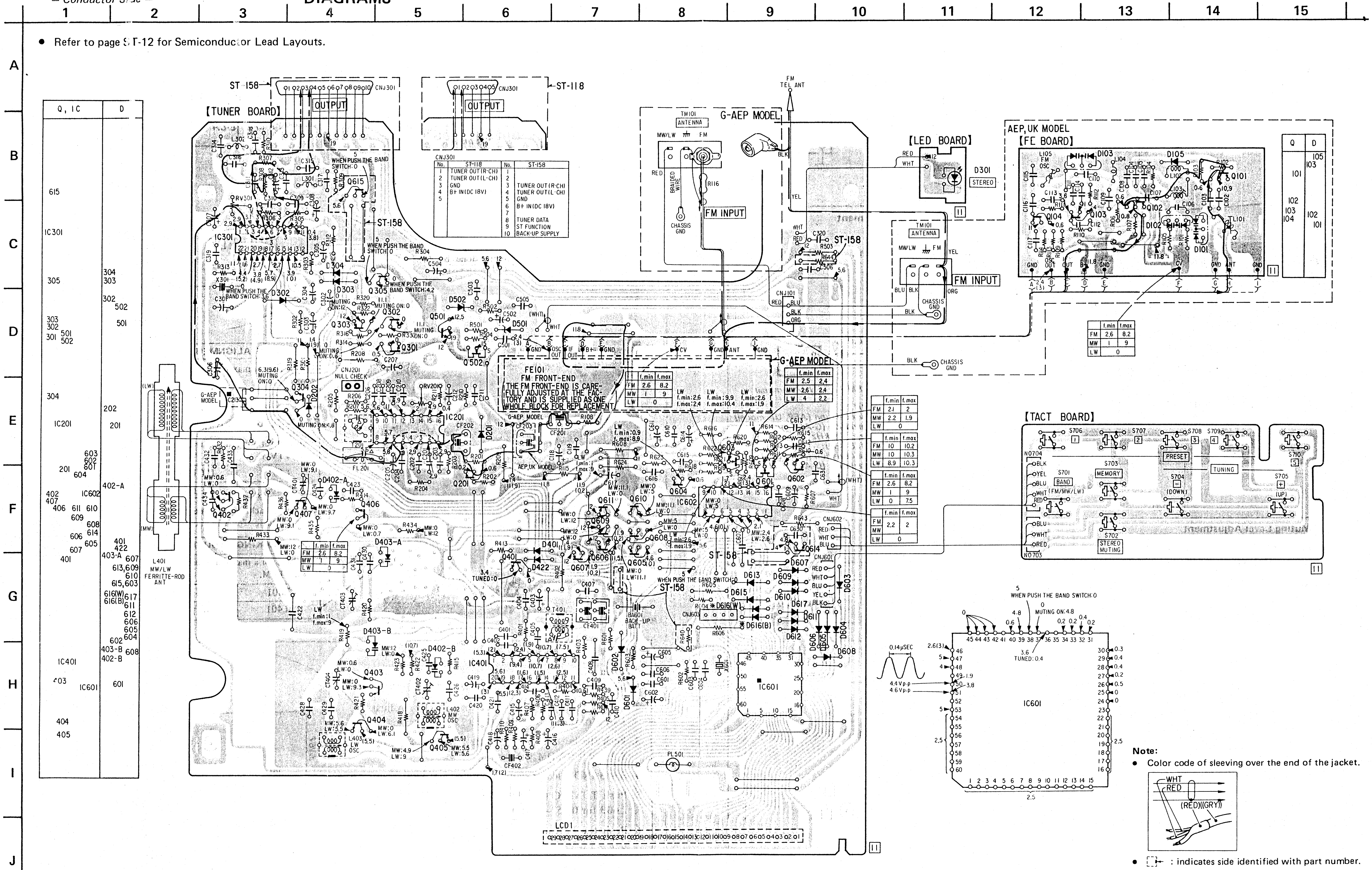
1. Set BAND selector switch to MW.
2. Push TUNING (+, –) button for 531 kHz. Adjust L402 for 0.95 – 1.05 V VOM ② reading.
3. Push the button for 1,602 kHz. Adjust CT402 for 8.9 – 9.0 V VOM ② reading.
4. Set BAND selector switch to LW.
5. Push TUNING (+, –) button for 153 kHz. Adjust L403 for 0.95 – 1.05 V VOM ① reading.
6. Push the button for 344 kHz. Adjust CT404 for 8.9 – 9.0 V VOM ① reading.


VOM ①: LW
(DC range)
VOM ②: MW
(DC range)
JW67
JW68
JW69
JW70
+
–

SECTION 3
DIAGRAMS

3-1. MOUNTING DIAGRAM
— Conductor Side —

- Refer to page ST-12 for Semiconductor Lead Layouts.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
【TUNER BOARD】
ST-158
ST-118
CNJ301
OUTPUT
FM TEL ANT
TM101 ANTENNA
G-AEP MODEL
MW/LW FM
BRAIDED WIRE
CHASSIS GND
FM INPUT
【LED BOARD】
D301 STEREO
AEP, UK MODEL
【FE BOARD】
L105 FM OSC
D103
D105
Q101
Q102
Q103
Q104
D101
D102
L101
GND OUT OUT B+ GND CV GND ANT GND
WHEN PUSH THE BAND SWITCH: 0
WHEN PUSH THE BAND SWITCH: 4.2
MUTING ON: 0
IC301
Q615
Q305
Q303
Q302
Q301
Q501
Q502
D301 D302 D303 D304
D501 D502
CNJ201 NULL CHECK
IC201
CF201 CF202 CF203
FL201
Q201
D201 D202
G-AEP MODEL
AEP, UK MODEL
L401 MW/LW FERRITTE-ROD ANT
(LW)
(MW)
Q402
Q403
Q404
Q405
Q406
Q407
D401
D402-A D402-B
D403-A D403-B
D422
IC401
T401
CF401
L402 MW OSC
L403 LW OSC
CF402
IC601
IC602
Q601 Q602 Q603 Q604 Q605 Q606 Q607 Q608 Q609 Q610 Q611
D601 D602 D603 D604 D606 D607 D608 D609 D610 D611 D612 D613 D614 D615 D616(W) D616(B) D617
BA601 BACK-UP BATT
X601
CNJ601
CNJ602
CNJ603
PL501
LCD1
CNJ101
TM101 ANTENNA
CHASSIS GND
【TACT BOARD】
S701 BAND (FM/MW/LW)
S702 STEREO MUTING
S703 MEMORY
S704 (DOWN)
S705 (UP)
S706 S707 S708 S709 S710
PRESET
TUNING
N0703
N0704
BLK YEL BLU WHT RED
0.14μSEC
4.4Vp-p
4.6Vp-p
3.6 TUNED: 0.4
MUTING ON: 4.8
11

	Q, IC	D
A		
B	615	
C	IC301 305	304 303
D	303 302 301 501 502	302 502 501
E	304 IC201	202 201
F	603 602 601 201 604 402 407 IC602 406 611 610 609 608 614 606 605 607	402-A 401 422
G	401	403-A 607 613,609 610 615,603 616(W) 616(B) 617 611 612 606 605 604 602
H	IC401 403 IC601 404	403-B 608 402-B 601
I	405	
J		

	Q	D
B	101	105 103
C	102 103 104	102 101

CNJ301

No.	ST-118	No.	ST-158
1	TUNER OUT (R-CH)	1	
2	TUNER OUT (L-CH)	2	
3	GND	3	TUNER OUT (R-CH)
4	B+ IN (DC 18V)	4	TUNER OUT (L-CH)
5		5	GND
		6	B+ IN (DC 18V)
		7	
		8	TUNER DATA
		9	ST FUNCTION
		10	BACK-UP SUPPLY

FE101
FM FRONT-END
THE FM FRONT-END IS CAREFULLY ADJUSTED AT THE FACTORY AND IS SUPPLIED AS ONE WHOLE BLOCK FOR REPLACEMENT.

	f.min	f.max
FM	2.6	8.2
MW	1	9
LW	0	

LW f.min: 2.6 f.max: 2.4

LW f.min: 9.9 f.max: 10.4

LW f.min: 2.6 f.max: 1.9

LW f.min: 0.9 f.max: 8.9

LW f.min: 1 f.max: 9

G-AEP MODEL

	f.min	f.max
FM	2.5	2.4
MW	2.6	2.4
LW	4	2.2

	f.min	f.max
FM	2.1	2
MW	2.2	1.9
LW	0	

	f.min	f.max
FM	10	10.2
MW	10	10.3
LW	8.9	10.3

	f.min	f.max
FM	2.6	8.2
MW	1	9
LW	0	7.5

	f.min	f.max
FM	2.2	2
MW		
LW	0	

	f.min	f.max
FM	2.6	8.2
MW	1	9
LW	0	

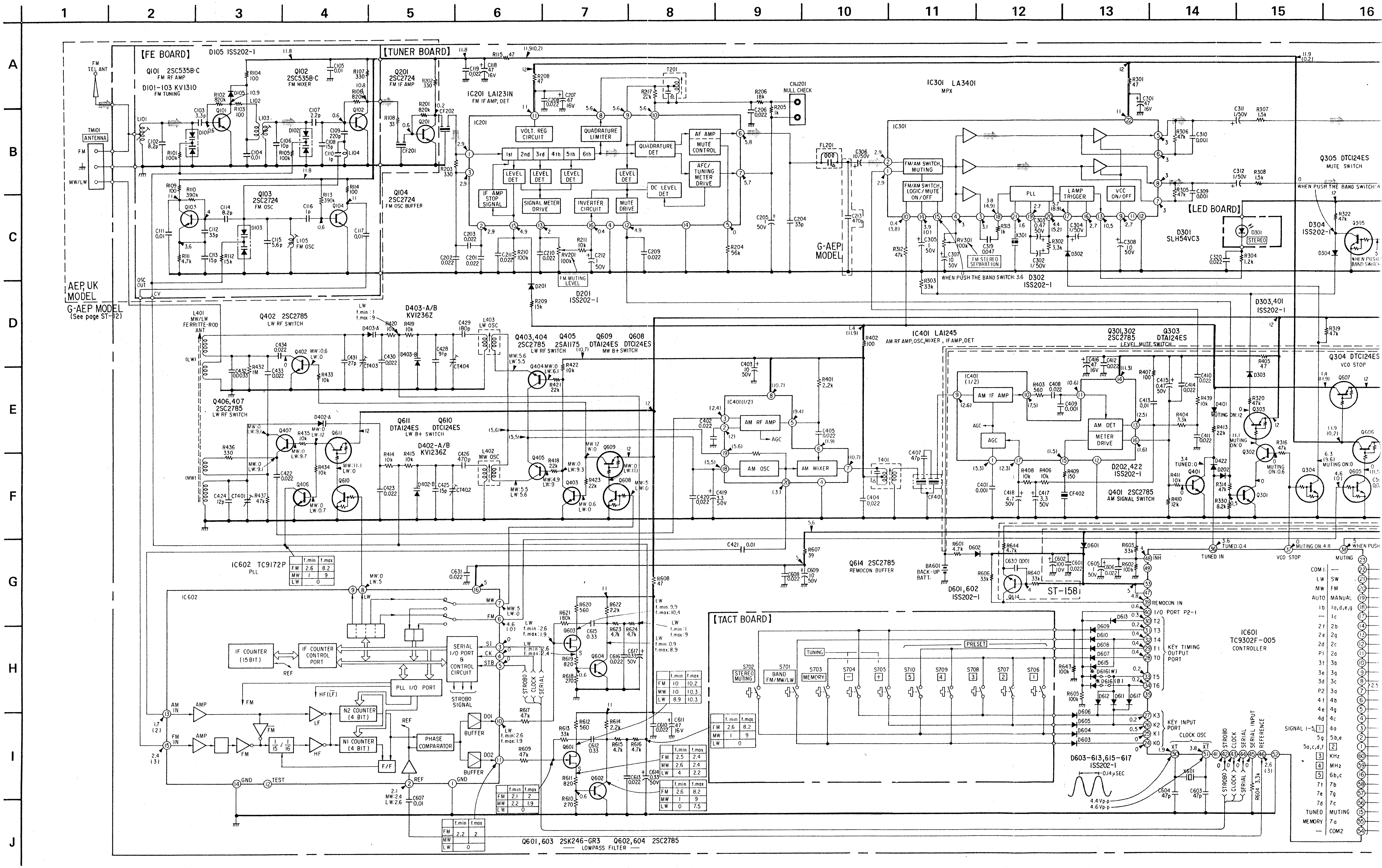
	f.min	f.max
FM	2.6	8.2
MW	1	9
LW	0	

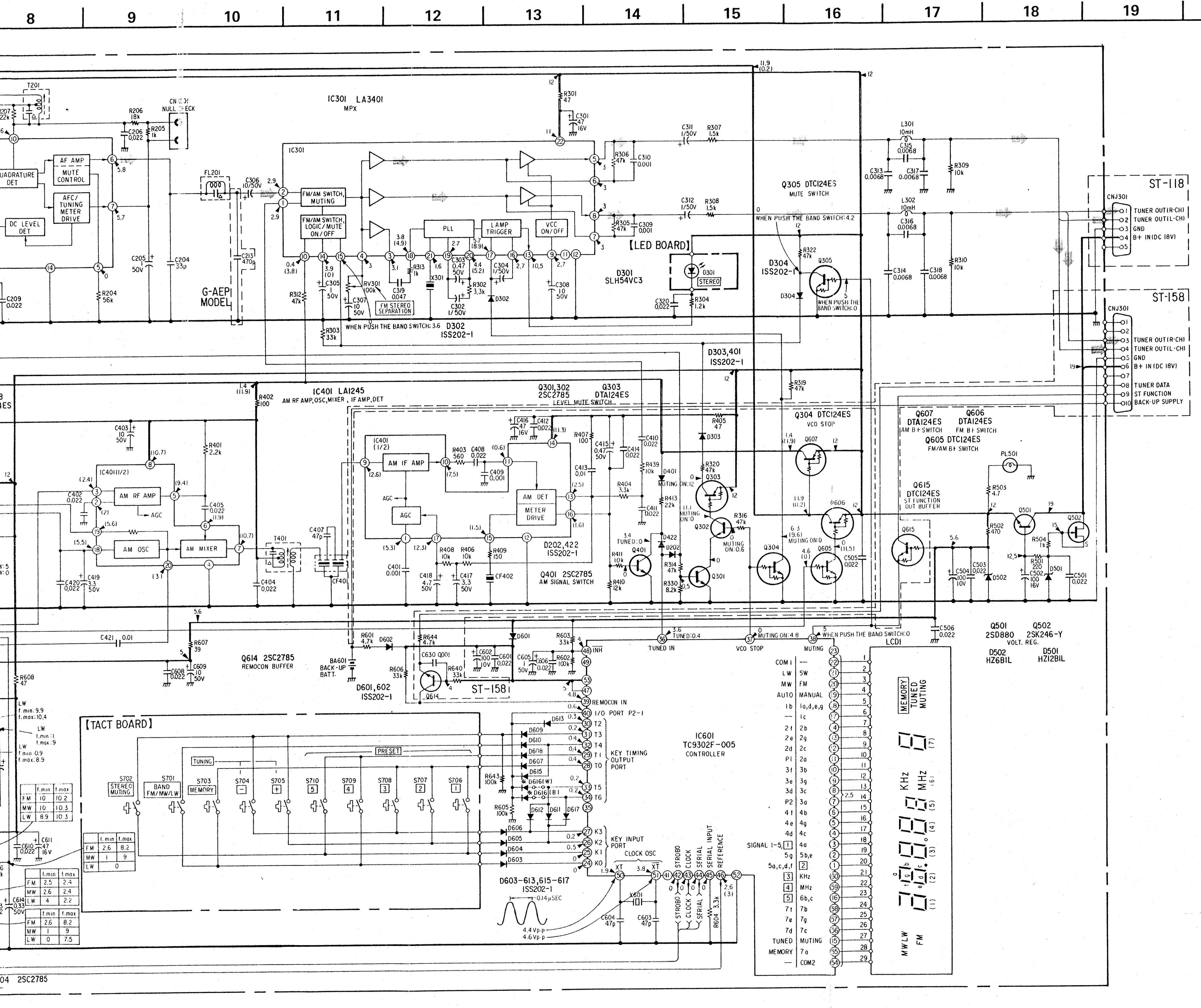
Note:
- Color code of sleeving over the end of the jacket.

WHT
RED
(RED)((GRY))

- ⬚← : indicates side identified with part number.
- ━ ➔ ━ : signal path
- ━━ ━ ━━➔ : L-CH signal path
- ━━ · · ━━➔ : R-CH signal path
- ▨ : B + pattern

3-2. SCHEMATIC DIAGRAM

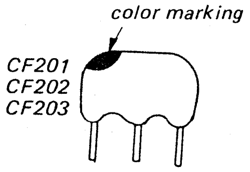

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
[FE BOARD]
[TUNER BOARD]
[LED BOARD]
[TACT BOARD]
FM TEL ANT
TM101 ANTENNA
FM
MW/LW
Q101 2SC535B-C FM RF AMP
D101-103 KV1310 FM TUNING
D105 1SS202-1
Q102 2SC535B-C FM MIXER
Q103 2SC2724 FM OSC
Q104 2SC2724 FM OSC BUFFER
Q201 2SC2724 FM IF AMP
CF201
CF202
IC201 LA1231N FM IF AMP, DET
VOLT. REG CIRCUIT
QUADRATURE LIMITER
1st
2nd
3rd
4th
5th
6th
LEVEL DET
QUADRATURE DET
AF AMP MUTE CONTROL
AFC/ TUNING METER DRIVE
IF AMP STOP SIGNAL
SIGNAL METER DRIVE
INVERTER CIRCUIT
MUTE DRIVE
DC LEVEL DET
T201
CNJ201 NULL CHECK
FM MUTING LEVEL
D201 1SS202-1
FL201
G-AEP MODEL
IC301 LA3401 MPX
FM/AM SWITCH, MUTING
FM/AM SWITCH, LOGIC/MUTE ON/OFF
PLL
LAMP TRIGGER
VCC ON/OFF
FM STEREO SEPARATION
WHEN PUSH THE BAND SWITCH: 3.6
D302 1SS202-1
X301
D301 SLH54VC3
STEREO
Q305 DTC124ES MUTE SWITCH
WHEN PUSH THE BAND SWITCH: 4
D304 1SS202-1
AEP, UK MODEL
G-AEP MODEL (See page ST-12)
OSC OUT
CV
L401 MW/LW FERRITE-ROD ANT
Q402 2SC2785 LW RF SWITCH
D403-A/B KV1236Z
L403 LW OSC
Q403,404 2SC2785 LW RF SWITCH
Q405 2SA1175 LW B+ SWITCH
Q609 DTA124ES MW B+ SWITCH
Q608 DTC124ES
Q406,407 2SC2785 LW RF SWITCH
Q611 DTA124ES
Q610 DTC124ES LW B+ SWITCH
D402-A/B KV1236Z
L402 MW OSC
IC401 LA1245 AM RF AMP, OSC, MIXER, IF AMP, DET
IC401 (1/2)
AM RF AMP
AGC
AM OSC
AM MIXER
T401
CF401
AM IF AMP
AM DET
METER DRIVE
D202,422 1SS202-1
Q401 2SC2785 AM SIGNAL SWITCH
Q301,302 2SC2785 LEVEL MUTE SWITCH
Q303 DTA124ES
Q304 DTC124ES VCO STOP
D303,401 1SS202-1
IC602 TC9172P PLL
IF COUNTER (15 BIT)
IF COUNTER CONTROL PORT
SERIAL I/O PORT & CONTROL CIRCUIT
PLL I/O PORT
N2 COUNTER (4 BIT)
N1 COUNTER (4 BIT)
PHASE COMPARATOR
F/F
BUFFER
STROBO SIGNAL
STROBO
CLOCK
SERIAL
AM IN
FM IN
AMP
LF
HF
1/15 / 1/16
GND
TEST
REF
Q601,603 2SK246-GR3
Q602,604 2SC2785
LOWPASS FILTER
Q614 2SC2785 REMOCON BUFFER
BA601 BACK-UP BATT.
D601,602 1SS202-1
ST-158
S702 STEREO MUTING
S701 BAND FM/MW/LW
S703 MEMORY
TUNING
PRESET
S704
S705
S710 5
S709 4
S708 3
S707 2
S706 1
D603-613,615-617 1SS202-1
KEY TIMING OUTPUT PORT
KEY INPUT PORT
CLOCK OSC
X601
IC601 TC9302F-005 CONTROLLER
REMOCON IN
I/O PORT P2-1
TUNED IN
VCO STOP
MUTING
STROBO
CLOCK
SERIAL INPUT
SERIAL INPUT
REFERENCE
0.4μSEC
4.4Vp-p
4.6Vp-p
COM1
LW SW
MW FM
AUTO MANUAL
1b 1a,d,e,g
1c
2f 2b
2e 2g
2d 2c
P1 2a
3f 3b
3e 3g
3d 3c
P2 3a
4f 4b
4e 4g
4d 4c
SIGNAL 1-5 4a
5g 5b,e
5a,c,d,f 2
3 KHz
4 MHz
5 6b,c
7f 7b
7e 7g
7d 7c
TUNED MUTING
MEMORY 7a
COM2
f.min f.max
FM 2.6 8.2
MW 1 9
LW 0
FM 10 10.2
MW 10 10.3
LW 8.9 10.3
FM 2.5 2.4
MW 2.6 2.4
LW 4 2.2
FM 2.6 8.2
MW 1 9
LW 0 7.5
FM 2.1 2
MW 2.2 1.9
LW 0
FM 2.2 2
MW 0
LW 0


8
9
10
11
12
13
14
15
16
17
18
19
IC301 LA3401
MPX
IC401 LA1245
AM RF AMP, OSC, MIXER, IF AMP, DET
IC601
TC9302F-005
CONTROLLER
FM/AM SWITCH, MUTING
FM/AM SWITCH, LOGIC/MUTE ON/OFF
PLL
LAMP TRIGGER
VCC ON/OFF
AF AMP
MUTE CONTROL
AFC/TUNING METER DRIVE
QUADRATURE DET
DC LEVEL DET
AM RF AMP
AM OSC
AM MIXER
AM IF AMP
AGC
AM DET
METER DRIVE
FM STEREO SEPARATION
G-AEP MODEL
[LED BOARD]
D301 SLH54VC3
STEREO
Q305 DTC124ES
MUTE SWITCH
Q304 DTC124ES
VCO STOP
Q301,302 2SC2785
Q303 DTA124ES
LEVEL MUTE SWITCH
Q401 2SC2785
AM SIGNAL SWITCH
Q607 DTA124ES
AM B+ SWITCH
Q606 DTA124ES
FM B+ SWITCH
Q605 DTC124ES
FM/AM B+ SWITCH
Q615 DTC124ES
ST FUNCTION OUT BUFFER
Q614 2SC2785
REMOCON BUFFER
Q501 2SD880
Q502 2SK246-Y
VOLT. REG.
D502 HZ6BIL
D501 HZ12BIL
D202,422 ISS202-1
D302 ISS202-1
D303,401 ISS202-1
D304 ISS202-1
D601,602 ISS202-1
D603-613,615-617 ISS202-1
BA601 BACK-UP BATT.
ST-118
CNJ301
TUNER OUT(R-CH)
TUNER OUT(L-CH)
GND
B+ IN(DC 18V)
ST-158
TUNER DATA
ST FUNCTION
BACK-UP SUPPLY
[TACT BOARD]
S702 STEREO MUTING
S701 BAND FM/MW/LW
S703 MEMORY
TUNING
PRESET
KEY TIMING OUTPUT PORT
KEY INPUT PORT
CLOCK OSC
REMOCON IN
I/O PORT P2-1
STROBO
CLOCK
SERIAL
SERIAL INPUT
REFERENCE
TUNED IN
VCO STOP
MUTING
LCD1
MEMORY
TUNED
MUTING
KHz
MHz
MW LW
FM
0.14μSEC
4.4Vp-p
4.6Vp-p
WHEN PUSH THE BAND SWITCH: 3.6
WHEN PUSH THE BAND SWITCH: 4.2
04 2SC2785

Note:

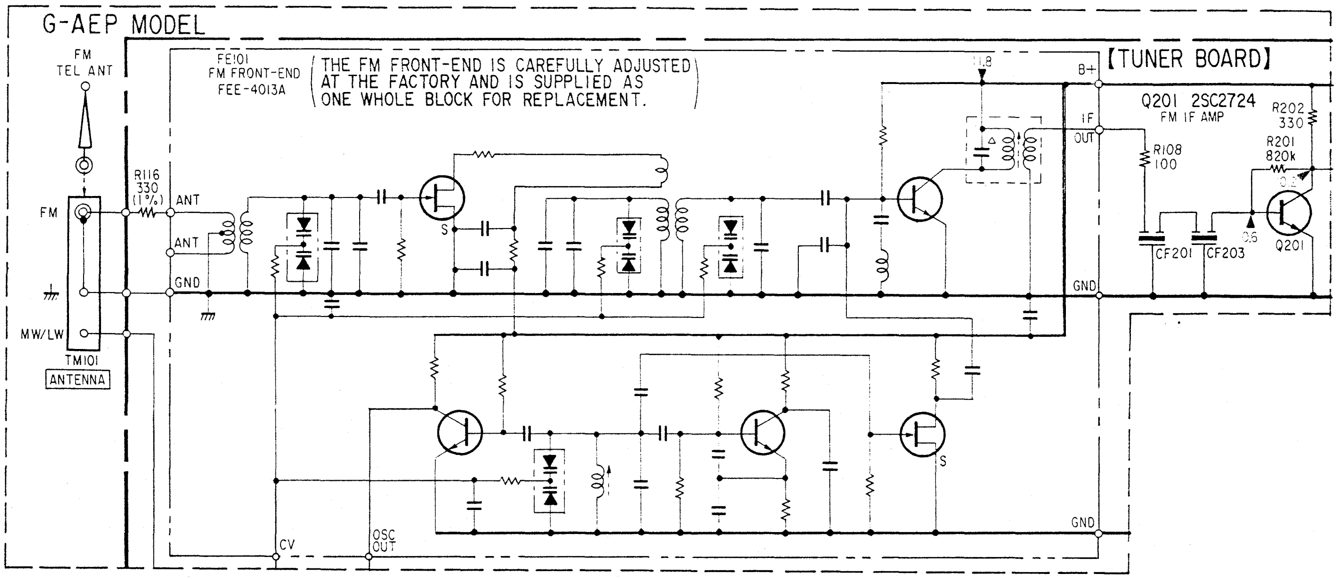
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.
- ⇨ : signal path.
- △ : internal component.
- ━━ : B+ bus.
- ▭ : adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under detuned conditions with a VOM (50 kΩ/V).
  no mark: FM
  ( ): AM
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken to ground in detuned mode by using oscilloscope. Voltage variations may be noted due to normal production tolerances.

※ : When replacing ceramic filters CF201, 202 and CF203 (G-AEP model), color marking on their bodies should be the same.
Connect or remove D616 according to color marking of ceramic filters.


color marking
CF201
CF202
CF203

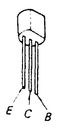
CF201 – 203 color marking	D616
black	D616 (B), connected
red	not connected
white	D616 (W), connected

3-3. FM FRONT-END SCHEMATIC DIAGRAM (G-AEP MODEL)

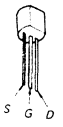

G-AEP MODEL
FM TEL ANT
FM
MW/LW
TM101
ANTENNA
R116 330 (1%)
ANT
ANT
GND
FE101 FM FRONT-END FEE-4013A
THE FM FRONT-END IS CAREFULLY ADJUSTED AT THE FACTORY AND IS SUPPLIED AS ONE WHOLE BLOCK FOR REPLACEMENT.
S
S
CV
OSC OUT
GND
B+
IF OUT
GND
11.8
[TUNER BOARD]
Q201 2SC2724 FM IF AMP
R108 100
R202 330
R201 820k
CF201
CF203
Q201
0.6

● Semiconductor Lead Layouts

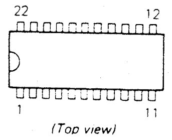
2SA733-P
2SC535



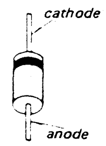
2SK246-GR2
2SK246-Y



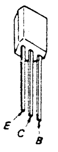
LA3401


22
12
1
11
(Top view)

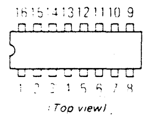
HZ6B1L
HZ12A3L


cathode
anode

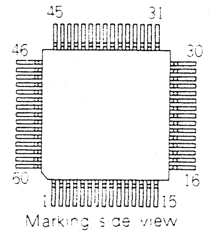
2SC2603-F
2SC2724-C
DTA124ES
DTC124ES



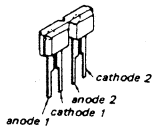
LA1231
TC9172P


16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)

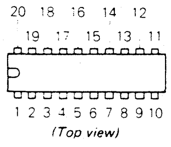
TC9302F-005


45
31
46
30
60
16
1
15
Marking side view

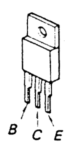
KV1236Z


cathode 2
anode 2
cathode 1
anode 1

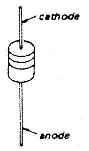
LA1245


20 18 16 14 12
19 17 15 13 11
1 2 3 4 5 6 7 8 9 10
(Top view)

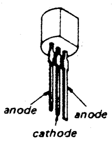
2SD880



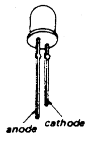
1SS202-1


cathode
anode

KV1310


anode
anode
cathode

SLH54VC3

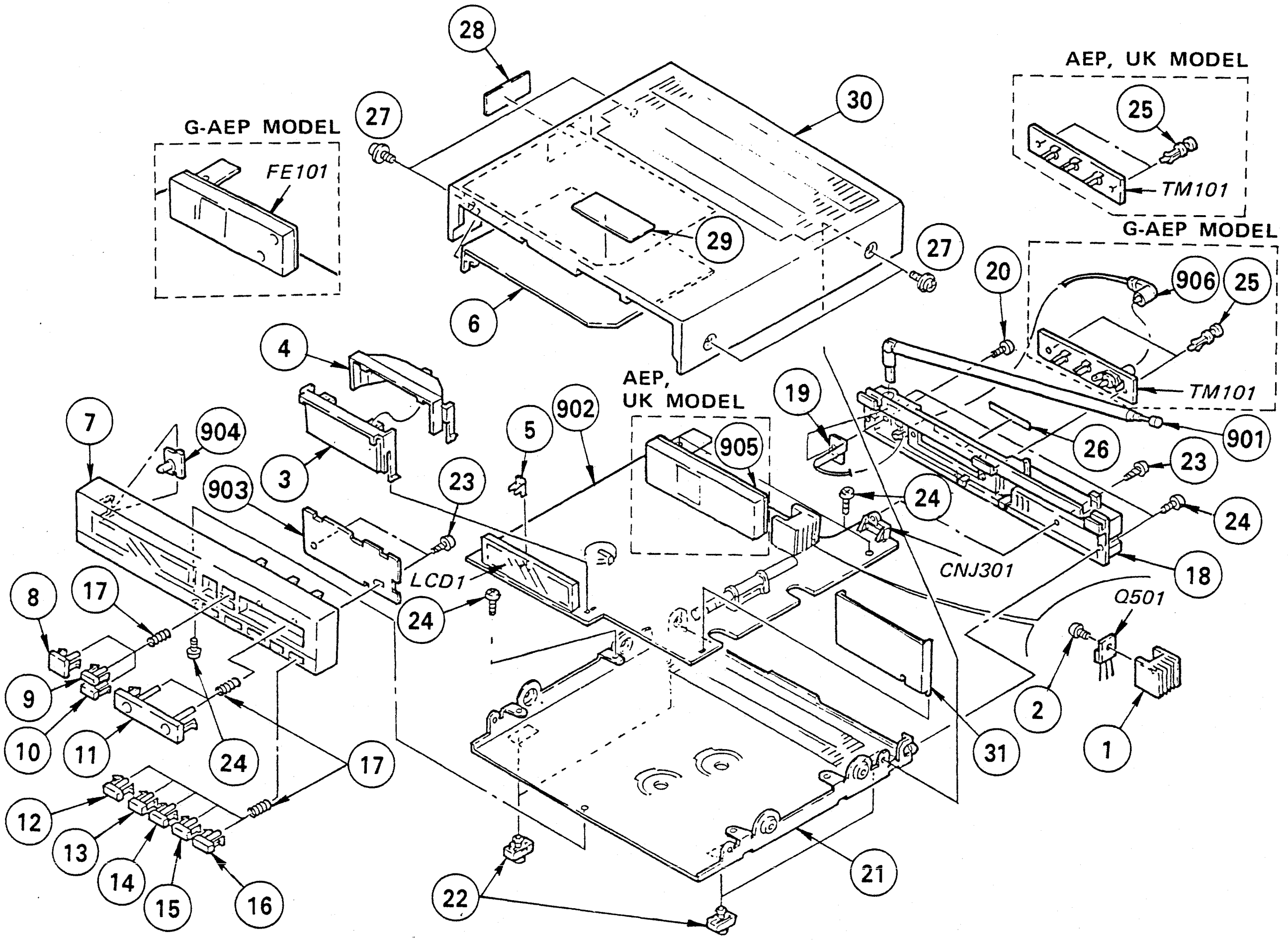

anode
cathode

SECTION 4
EXPLODED VIEWS AND PARTS LIST

NOTE:

The mechanical parts with no reference number in the exploded views are not supplied.

- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number in the remark column.



No.	Part No.	Description	Remarks
1	*4-363-146-00	HEAT SINK, V.OUT	
2	7-685-872-01	SCREW +BVTT 3×8 (S)	
3	*4-904-514-01	ILLUMINATOR	
4	*4-904-515-01	HOUSE, LAMP	
5	*4-904-507-01	BLIND, LAMP	
6	4-910-337-01	PLATE, SHIELD	
7	X-4910-020-1	(ST-118:SILVER)...PANEL ASSY, FRONT	
	X-4910-020-2	(ST-118:BLACK)....PANEL ASSY, FRONT	
	X-4910-034-1	(ST-158:SILVER)...PANEL ASSY, FRONT	
	X-4910-034-2	(ST-158:BLACK)....PANEL ASSY, FRONT	
8	4-910-093-01	(SILVER)...BUTTON, SQUARE (BAND)	
	4-910-093-11	(BLACK)....BUTTON, SQUARE (BAND)	
9	4-910-087-01	(BLACK)....BUTTON(B), SQUARE(STEREO MUTING)	
	4-910-089-01	(SILVER)...BUTTON(S), SQUARE(STEREO MUTING)	
10	4-910-087-11	(BLACK)....BUTTON (B), SQUARE (MEMORY)	
	4-910-089-11	(SILVER)...BUTTON (S), SQUARE (MEMORY)	
11	4-910-094-01	(SILVER)...BUTTON, SQUARE (TUNING)	
	4-910-094-11	(BLACK)....BUTTON, SQUARE (TUNING)	
12	4-910-086-01	(SILVER)...BUTTON, SQUARE (PRESET 1)	
	4-910-086-51	(BLACK)....BUTTON, SQUARE (PRESET 1)	
13	4-910-086-11	(SILVER)...BUTTON, SQUARE (PRESET 2)	
	4-910-086-61	(BLACK)....BUTTON, SQUARE (PRESET 2)	
14	4-910-086-21	(SILVER)...BUTTON, SQUARE (PRESET 3)	
	4-910-086-71	(BLACK)....BUTTON, SQUARE (PRESET 3)	
15	4-910-086-31	(SILVER)...BUTTON, SQUARE (PRESET 4)	
	4-910-086-81	(BLACK)....BUTTON, SQUARE (PRESET 4)	
16	4-910-086-41	(SILVER)...BUTTON, SQUARE (PRESET 5)	
	4-910-086-91	(BLACK)....BUTTON, SQUARE (PRESET 5)	
17	4-886-032-00	SPRING, COMPRESSION	
18	4-910-098-01	(ST-158)....PLATE, JACK	
	4-910-098-11	(ST-118)....PLATE, JACK	
19	*4-910-081-01	TERMINAL BOARD, ROD ANTENNA	
20	7-682-548-09	SCREW +B 3X8	
21	*4-902-941-21	CHASSIS	
22	X-4902-937-1	FOOT ASSY, RUBBER	
23	7-685-646-71	SCREW +BVTP 3X8 TYPE2 N-S	
24	7-685-871-01	SCREW +BVTT 3X6 (S)	
25	4-829-039-00	RIVET, NYLON	
26	*4-910-084-01	(AEP,UK)...LABEL, ANTENNA	
	*4-910-085-01	(G-AEP)....LABEL, ANTENNA	
27	4-886-821-21	(BLACK)....SCREW, M3 CASE STOPPER	
	4-886-821-31	(SILVER)...SCREW, M3 CASE STOPPER	
28	*4-910-005-01	(ST-118)...LABEL, MODEL NUMBER	
	*4-910-008-01	(ST-158)...LABEL, MODEL NUMBER	
29	4-884-927-00	LABEL (SYSTEM), CAUTION	
30	X-4902-904-1	(BLACK)....CASE ASSY	
	X-4902-905-1	(SILVER)...CASE ASSY	
31	*4-910-090-01	PLATE, SHIELD	
901	1-501-270-00	ANTENNA, TELESCOPIC	
902	*A-4351-438-A	(ST-118:AEP,UK)...MOUNTED PCB, TUNER	
	*A-4351-439-A	(ST-118:G-AEP)....MOUNTED PCB, TUNER	
	*A-4351-442-A	(ST-158:AEP,UK)...MOUNTED PCB, TUNER	
	*A-4351-443-A	(ST-158:G-AEP)....MOUNTED PCB, TUNER	
903	*1-615-524-11	PC BOARD, TACT	
904	*1-615-525-11	PC BOARD, LED	
905	*1-615-526-11	(AEP,UK)...PC BOARD, F.E	
906	*1-562-908-11	(G-AEP)...CONNECTOR, FEMALE (NO SHIELD)	
CNJ301	1-562-067-00	(ST-118)...SOCKET, CONNECTOR 5P	
CNJ301	1-562-479-11	(ST-158)...SOCKET, CONNECTOR 10P	
FE1	1-463-611-11	(G-AEP)....FRONT END, FM (FEE-4013A)	
LCD1	1-806-874-11	INDICATOR; L-CRYSTAL LT5056	
Q501	8-729-288-02	TRANSISTOR 2SD880	
TM101	1-536-901-11	(AEP,UK)...TERMINAL BOARD 3P, ANTENNA	
TM101	1-536-733-11	(G-AEP)....TERMINAL BOARD, ANTENNA	

SECTION 5

ELECTRICAL PARTS LIST

NOTE:

- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC,
UPD...: μPD...

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	1-501-270-00	ANTENNA, TELESCOPIC			
902	*A-4351-438-A	(ST-118:AEP,UK)...MOUNTED PCB, TUNER			
	*A-4351-439-A	(ST-118:G-AEP)....MOUNTED PCB, TUNER			
	*A-4351-442-A	(ST-158:AEP,UK)...MOUNTED PCB, TUNER			
	*A-4351-443-A	(ST-158:G-AEP)....MOUNTED PCB, TUNER			
903	*1-615-524-11	PC BOARD, TACT			
904	*1-615-525-11	PC BOARD, LED			
905	*1-615-526-11	(AEP,UK)...PC BOARD, F.E			
906	*1-562-908-11	(G-AEP)....CONNECTOR, FEMALE(NO SHIELD)			
BA601	1-528-120-00	BATTERY, LITHIUM (CR-2025)			
C102	1-162-198-31	(AEP,UK)...CERAMIC	8.2PF	10%	50V
C103	1-162-193-31	(AEP,UK)...CERAMIC	3.3PF	10%	50V
C104	1-162-306-31	(AEP,UK)...CERAMIC	0.01MF	20%	16V
C105	1-162-306-31	(AEP,UK)...CERAMIC	0.01MF	20%	16V
C106	1-162-199-31	(AEP,UK)...CERAMIC	10PF	5%	50V
C107	1-162-191-31	(AEP,UK)...CERAMIC	2.2PF	10%	50V
C108	1-162-203-31	(AEP,UK)...CERAMIC	15PF	5%	50V
C109	1-162-286-31	(AEP,UK)...CERAMIC	220PF	10%	50V
C110	1-162-187-31	(AEP,UK)...CERAMIC	1PF	20%	50V
C111	1-162-306-31	(AEP,UK)...CERAMIC	0.01MF	20%	16V
C112	1-162-211-31	(AEP,UK)...CERAMIC	33PF	5%	50V
C113	1-162-203-31	(AEP,UK)...CERAMIC	15PF	5%	50V
C114	1-162-198-31	(AEP,UK)...CERAMIC	8.2PF	10%	50V
C115	1-162-196-31	(AEP,UK)...CERAMIC	5.6PF	10%	50V
C116	1-162-187-31	(AEP,UK)...CERAMIC	1PF	20%	50V
C117	1-162-306-31	(AEP,UK)...CERAMIC	0.01MF	20%	16V
C118	1-123-332-00	ELECT	47MF	20%	25V
C119	1-101-005-00	CERAMIC	0.022MF		50V
C201	1-101-005-00	CERAMIC	0.022MF		50V
C202	1-101-005-00	CERAMIC	0.022MF		50V
C203	1-101-005-00	CERAMIC	0.022MF		50V
C204	1-162-211-31	CERAMIC	33PF	5%	50V
C205	1-123-380-00	ELECT	1MF	20%	100V
C206	1-101-005-00	CERAMIC	0.022MF		50V
C207	1-123-332-00	ELECT	47MF	20%	25V
C208	1-101-005-00	CERAMIC	0.022MF		50V
C209	1-101-005-00	CERAMIC	0.022MF		50V
C210	1-101-005-00	CERAMIC	0.022MF		50V
C211	1-101-005-00	CERAMIC	0.022MF		50V
C212	1-123-380-00	ELECT	1MF	20%	100V
C213	1-162-290-31	(G-AEP)...ELECT	470PF	10%	50V
C301	1-123-332-00	ELECT	47MF	20%	25V
C302	1-123-380-00	ELECT	1MF	20%	100V
C303	1-123-379-00	ELECT	0.47MF	20%	100V
C304	1-123-380-00	ELECT	1MF	20%	100V
C305	1-123-380-00	ELECT	1MF	20%	100V
C306	1-123-356-00	ELECT	10MF	20%	50V
C307	1-123-356-00	ELECT	10MF	20%	50V
C308	1-123-356-00	ELECT	10MF	20%	50V
C309	1-162-294-31	CERAMIC	0.001MF	10%	50V
C310	1-162-294-31	CERAMIC	0.001MF	10%	50V
C311	1-123-380-00	ELECT	1MF	20%	100V
C312	1-123-380-00	ELECT	1MF	20%	100V
C313	1-162-305-31	CERAMIC	0.0068MF	20%	16V
C314	1-162-305-31	CERAMIC	0.0068MF	20%	16V
C315	1-162-305-31	CERAMIC	0.0068MF	20%	16V
C316	1-162-305-31	CERAMIC	0.0068MF	20%	16V
C317	1-162-305-31	CERAMIC	0.0068MF	20%	16V
C318	1-162-305-31	CERAMIC	0.0068MF	20%	16V
C319	1-130-491-00	MYLAR	0.047MF	5%	50V
C320	1-101-005-00	CERAMIC	0.022MF		50V
C401	1-162-294-31	CERAMIC	0.001MF	10%	50V
C402	1-101-005-00	CERAMIC	0.022MF		50V
C403	1-123-356-00	ELECT	10MF	20%	50V
C404	1-101-005-00	CERAMIC	0.022MF		50V
C405	1-101-005-00	CERAMIC	0.022MF		50V
C407	1-162-215-31	CERAMIC	47PF	5%	50V
C408	1-161-494-00	CERAMIC	0.022MF	30%	25V
C409	1-162-294-31	CERAMIC	0.001MF	10%	50V
C410	1-130-487-00	MYLAR	0.022MF	5%	50V
C411	1-101-005-00	CERAMIC	0.022MF		50V
C412	1-101-005-00	CERAMIC	0.022MF		50V
C413	1-162-306-31	CERAMIC	0.01MF	20%	16V
C414	1-101-005-00	CERAMIC	0.022MF		50V
C415	1-123-379-00	ELECT	0.47MF	20%	100V
C416	1-123-332-00	ELECT	47MF	20%	25V
C417	1-123-382-00	ELECT	3.3MF	20%	100V
C418	1-123-369-00	ELECT	4.7MF	20%	63V
C419	1-123-382-00	ELECT	3.3MF	20%	100V
C420	1-101-005-00	CERAMIC	0.022MF		50V
C421	1-162-306-31	CERAMIC	0.01MF	20%	16V
C422	1-161-494-00	CERAMIC	0.022MF	30%	25V
C423	1-101-005-00	CERAMIC	0.022MF		50V
C424	1-102-949-00	CERAMIC	12PF	5%	50V
C425	1-102-880-00	CERAMIC	15PF	5%	50V
C426	1-104-069-00	POLYSTYRENE	470PF	5%	50V
C428	1-102-701-00	CERAMIC	91PF	5%	50V
C429	1-103-707-00	STYROL	180PF	5%	50V
C430	1-101-005-00	CERAMIC	0.022MF		50V
C431	1-102-961-00	CERAMIC	27PF	5%	50V
C432	1-162-303-31	CERAMIC	0.0033MF	20%	16V
C433	1-161-494-00	CERAMIC	0.022MF	30%	25V
C434	1-101-005-00	CERAMIC	0.022MF		50V
C501	1-101-005-00	CERAMIC	0.022MF		50V
C502	1-123-333-00	ELECT	100MF	20%	25V
C503	1-101-005-00	CERAMIC	0.022MF		50V
C504	1-123-307-00	ELECT	100MF	20%	10V
C505	1-101-005-00	CERAMIC	0.022MF		50V
C506	1-101-005-00	CERAMIC	0.022MF		50V
C601	1-101-005-00	CERAMIC	0.022MF		50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C602	1-123-307-00	ELECT	100MF	20%	10V
C603	1-102-852-00	CERAMIC	47PF	5%	50V
C604	1-102-852-00	CERAMIC	47PF	5%	50V
C605	1-123-380-00	ELECT	1MF	20%	100V
C606	1-101-005-00	CERAMIC	0.022MF		50V
C607	1-162-306-31	CERAMIC	0.01MF	20%	16V
C608	1-101-005-00	CERAMIC	0.022MF		50V
C609	1-123-356-00	ELECT	10MF	20%	50V
C610	1-101-005-00	CERAMIC	0.022MF		50V
C611	1-123-332-00	ELECT	47MF	20%	25V
C612	1-136-171-00	FILM	0.33MF	5%	50V
C613	1-130-487-00	MYLAR	0.022MF	5%	50V
C614	1-123-609-00	ELECT	0.33MF	20%	50V
C615	1-136-171-00	FILM	0.33MF	5%	50V
C616	1-130-487-00	MYLAR	0.022MF	5%	50V
C617	1-123-609-00	ELECT	0.33MF	20%	50V
C630	1-162-294-31	(ST-158)...CERAMIC	0.001MF	10%	50V
C631	1-101-005-00	CERAMIC	0.022MF		50V
CF201	1-527-968-00	FILTER, CERAMIC			
CF202	1-527-968-00	FILTER, CERAMIC			
CF203	1-527-968-00	(G-AEP)....FILTER, CERAMIC			
CF401	1-527-937-00	FILTER, CERAMIC			
CF402	1-527-981-00	FILTER, CERAMIC			
CNJ101	*1-562-327-00	SOCKET, CONNECTOR 3P			
CNJ201	*1-560-060-00	PIN, CONNECTOR 2P (NULL CHECK POINT)			
CNJ301	1-562-067-00	(ST-118)...SOCKET, CONNECTOR 5P			
CNJ301	1-562-479-11	(ST-158)...SOCKET, CONNECTOR 10P			
CNJ601	*1-560-604-00	PIN, CONNECTOR 5P			
CNJ602	*1-560-602-00	PIN, CONNECTOR 3P			
CNJ603	*1-560-603-00	PIN, CONNECTOR 4P			
CT401	1-141-227-00	CAP, CERAMIC TRIMMER			
CT402	1-141-227-00	CAP, CERAMIC TRIMMER			
CT403	1-141-227-00	CAP, CERAMIC TRIMMER			
CT404	1-141-227-00	CAP, CERAMIC TRIMMER			
D101	8-719-918-45	(AEP,UK)...DIODE KV1310			
D102	8-719-918-45	(AEP,UK)...DIODE KV1310			
D103	8-719-918-45	(AEP,UK)...DIODE KV1310			
D105	8-719-107-94	(AEP,UK)...DIODE 1SS202-1			
D201	8-719-107-94	DIODE 1SS202-1			
D202	8-719-107-94	DIODE 1SS202-1			
D301	8-719-904-08	DIODE SLH54VC3			
D302	8-719-107-94	DIODE 1SS202-1			
D303	8-719-107-94	DIODE 1SS202-1			
D304	8-719-107-94	DIODE 1SS202-1			
D401	8-719-107-94	DIODE 1SS202-1			
D402	8-719-902-79	DIODE KV1236Z			
D403	8-719-902-79	DIODE KV1236Z			
D422	8-719-107-94	DIODE 1SS202-1			
D501	8-719-910-23	DIODE HZ12A3L			
D502	8-719-910-64	DIODE HZ6B1L			
D601	8-719-107-94	DIODE 1SS202-1			
D602	8-719-107-94	DIODE 1SS202-1			
D603	8-719-107-94	DIODE 1SS202-1			
D604	8-719-107-94	DIODE 1SS202-1			
D605	8-719-107-94	DIODE 1SS202-1			
D606	8-719-107-94	DIODE 1SS202-1			
D607	8-719-107-94	DIODE 1SS202-1			
D608	8-719-107-94	DIODE 1SS202-1			

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D609	8-719-107-94	DIODE 1SS202-1
D610	8-719-107-94	DIODE 1SS202-1
D611	8-719-107-94	DIODE 1SS202-1
D612	8-719-107-94	DIODE 1SS202-1
D613	8-719-107-94	DIODE 1SS202-1
D615	8-719-107-94	DIODE 1SS202-1
D616	8-719-107-94	DIODE 1SS202-1
D617	8-719-107-94	DIODE 1SS202-1
FE101	1-463-611-11	(G-AEP)....FRONT END, FM (FEE-4013A)
FL201	1-235-126-00	ENCAPSULATED COMPONENT
IC201	8-759-812-31	IC LA1231
IC301	8-759-801-80	IC LA3401
IC401	8-759-812-45	IC LA1245
IC601	8-759-204-24	IC TC9302F-005
IC602	8-759-202-63	IC TC9172P
L101	*1-422-214-11	(AEP,UK)...COIL, AIR-CORE
L102	*1-422-040-00	(AEP,UK)...COIL, AIR-CORE
L103	*1-422-081-00	(AEP,UK)...COIL (WITH CORE)
L104	*1-422-039-00	(AEP,UK)...COIL, AIR-CORE
L105	*1-459-396-00	(AEP,UK)...COIL (WITH CORE)
L301	1-408-924-00	MICRO INDUCTOR 10MMH
L302	1-408-924-00	MICRO INDUCTOR 10MMH
L401	1-402-151-11	ANTENNA, FERRITE-ROD (LW/MW)
L402	1-406-089-11	COIL (OSC)
L403	1-406-090-11	COIL (OSC)
LCD1	1-806-874-11	INDICATOR, L-CRYSTAL LT5056
PL501	1-518-511-00	(SILVER)...LAMP, PILOT, GREEN
PL501	1-518-511-21	(BLACK)....LAMP, PILOT, YELLOW
Q101	8-729-353-52	(AEP,UK)...TRANSISTOR 2SC535
Q102	8-729-353-52	(AEP,UK)...TRANSISTOR 2SC535
Q103	8-729-672-42	(AEP,UK)...TRANSISTOR 2SC2724-C
Q104	8-729-672-42	(AEP,UK)...TRANSISTOR 2SC2724-C
Q201	8-729-672-42	TRANSISTOR 2SC2724-C
Q301	8-729-606-33	TRANSISTOR 2SC2603-F
Q302	8-729-606-33	TRANSISTOR 2SC2603-F
Q303	8-729-900-63	TRANSISTOR DTA124ES
Q304	8-729-900-36	TRANSISTOR DTC124ES
Q305	8-729-900-36	TRANSISTOR DTC124ES
Q401	8-729-606-33	TRANSISTOR 2SC2603-F
Q402	8-729-606-33	TRANSISTOR 2SC2603-F
Q403	8-729-606-33	TRANSISTOR 2SC2603-F
Q404	8-729-606-33	TRANSISTOR 2SC2603-F
Q405	8-729-173-37	TRANSISTOR 2SA733-P
Q406	8-729-606-33	TRANSISTOR 2SC2603-F
Q407	8-729-606-33	TRANSISTOR 2SC2603-F
Q501	8-729-288-02	TRANSISTOR 2SD880
Q502	8-729-224-61	TRANSISTOR 2SK246-Y
Q601	8-729-201-56	TRANSISTOR 2SK246-GR2
Q602	8-729-606-33	TRANSISTOR 2SC2603-F
Q603	8-729-201-56	TRANSISTOR 2SK246-GR2
Q604	8-729-606-33	TRANSISTOR 2SC2603-F
Q605	8-729-900-36	TRANSISTOR DTC124ES
Q606	8-729-900-63	TRANSISTOR DTA124ES
Q607	8-729-900-63	TRANSISTOR DTA124ES
Q608	8-729-900-36	TRANSISTOR DTC124ES
Q609	8-729-900-63	TRANSISTOR DTA124ES
Q610	8-729-900-36	TRANSISTOR DTC124ES
Q611	8-729-900-63	TRANSISTOR DTA124ES
Q614	8-729-606-33	(ST-158)...TRANSISTOR 2SC2603-F
Q615	8-729-900-36	(ST-158)...TRANSISTOR DTC124ES

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R101	1-247-879-00	(AEP,UK)...CARBON	100K	5%	1/6W
R102	1-247-901-00	(AEP,UK)...CARBON	820K	5%	1/6W
R103	1-247-807-00	(AEP,UK)...CARBON	100	5%	1/6W
R104	1-247-807-00	(AEP,UK)...CARBON	100	5%	1/6W
R105	1-247-879-00	(AEP,UK)...CARBON	100K	5%	1/6W
R106	1-247-901-00	(AEP,UK)...CARBON	820K	5%	1/6W
R107	1-247-819-00	(AEP,UK)...CARBON	330	5%	1/6W
R108	1-247-795-00	(AEP,UK)...CARBON	33	5%	1/6W
R108	1-247-807-00	(G-AEP)....CARBON	100	5%	1/6W
R109	1-247-807-00	(AEP,UK)...CARBON	100	5%	1/6W
R110	1-247-893-00	(AEP,UK)...CARBON	390K	5%	1/6W
R111	1-247-847-00	(AEP,UK)...CARBON	4.7K	5%	1/6W
R112	1-247-859-00	(AEP,UK)...CARBON	15K	5%	1/6W
R113	1-247-893-00	(AEP,UK)...CARBON	390K	5%	1/6W
R114	1-247-807-00	(AEP,UK)...CARBON	100	5%	1/6W
R115	1-247-799-00	CARBON	47	5%	1/6W
R116	1-246-461-00	(G-AEP)...CARBON	330	1%	1/5W
R201	1-247-901-00	CARBON	820K	5%	1/6W
R202	1-247-819-00	CARBON	330	5%	1/6W
R203	1-247-819-00	CARBON	330	5%	1/6W
R204	1-247-873-00	CARBON	56K	5%	1/6W
R205	1-247-831-00	CARBON	1K	5%	1/6W
R206	1-247-861-00	CARBON	18K	5%	1/6W
R207	1-247-863-00	CARBON	22K	5%	1/6W
R208	1-247-799-00	CARBON	47	5%	1/6W
R209	1-247-859-00	CARBON	15K	5%	1/6W
R210	1-247-879-00	CARBON	100K	5%	1/6W
R211	1-247-855-00	CARBON	10K	5%	1/6W
R301	1-247-799-00	CARBON	47	5%	1/6W
R302	1-247-843-00	CARBON	3.3K	5%	1/6W
R303	1-247-867-00	CARBON	33K	5%	1/6W
R304	1-247-833-00	CARBON	1.2K	5%	1/6W
R305	1-247-871-00	CARBON	47K	5%	1/6W
R306	1-247-871-00	CARBON	47K	5%	1/6W
R307	1-247-835-00	CARBON	1.5K	5%	1/6W
R308	1-247-835-00	CARBON	1.5K	5%	1/6W
R309	1-247-855-00	CARBON	10K	5%	1/6W
R310	1-247-855-00	CARBON	10K	5%	1/6W
R312	1-247-871-00	CARBON	47K	5%	1/6W
R313	1-247-831-00	CARBON	1K	5%	1/6W
R314	1-247-871-00	CARBON	47K	5%	1/6W
R316	1-247-871-00	CARBON	47K	5%	1/6W
R319	1-247-871-00	CARBON	47K	5%	1/6W
R320	1-247-871-00	CARBON	47K	5%	1/6W
R322	1-247-871-00	CARBON	47K	5%	1/6W
R330	1-247-853-00	CARBON	8.2K	5%	1/6W
R401	1-249-421-11	CARBON	2.2K	5%	1/6W
R402	1-247-807-00	CARBON	100	5%	1/6W
R403	1-247-825-00	CARBON	560	5%	1/6W
R404	1-247-843-00	CARBON	3.3K	5%	1/6W
R405	1-247-799-00	CARBON	47	5%	1/6W
R406	1-247-855-00	CARBON	10K	5%	1/6W
R407	1-247-807-00	CARBON	100	5%	1/6W
R408	1-247-855-00	CARBON	10K	5%	1/6W
R409	1-247-811-00	CARBON	150	5%	1/6W
R410	1-247-857-00	CARBON	12K	5%	1/6W
R411	1-247-855-00	CARBON	10K	5%	1/6W
R413	1-247-863-00	CARBON	22K	5%	1/6W
R414	1-247-855-00	CARBON	10K	5%	1/6W
R415	1-247-855-00	CARBON	10K	5%	1/6W
R418	1-247-863-00	CARBON	22K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R419	1-247-855-00	CARBON	10K	5%	1/6W
R420	1-247-855-00	CARBON	10K	5%	1/6W
R421	1-247-863-00	CARBON	22K	5%	1/6W
R422	1-247-855-00	CARBON	10K	5%	1/6W
R423	1-247-863-00	CARBON	22K	5%	1/6W
R432	1-247-903-00	CARBON	1M	5%	1/6W
R433	1-247-855-00	CARBON	10K	5%	1/6W
R434	1-247-855-00	CARBON	10K	5%	1/6W
R435	1-247-855-00	CARBON	10K	5%	1/6W
R436	1-247-819-00	CARBON	330	5%	1/6W
R437	1-247-871-00	CARBON	47K	5%	1/6W
R439	1-247-855-00	CARBON	10K	5%	1/6W
R501	1-247-815-00	CARBON	220	5%	1/6W
R502	1-247-823-00	CARBON	470	5%	1/6W
R503	1-247-775-00	CARBON	4.7	5%	1/6W
R504	1-247-831-00	CARBON	1K	5%	1/6W
R601	1-247-847-00	CARBON	4.7K	5%	1/6W
R602	1-247-879-00	CARBON	100K	5%	1/6W
R603	1-247-867-00	CARBON	33K	5%	1/6W
R604	1-247-843-00	CARBON	3.3K	5%	1/6W
R605	1-247-879-00	CARBON	100K	5%	1/6W
R606	1-247-867-00	CARBON	33K	5%	1/6W
R607	1-247-797-00	CARBON	39	5%	1/6W
R608	1-247-799-00	CARBON	47	5%	1/6W
R609	1-247-871-00	CARBON	47K	5%	1/6W
R610	1-247-817-00	CARBON	270	5%	1/6W
R611	1-247-829-00	CARBON	820	5%	1/6W
R612	1-247-825-00	CARBON	560	5%	1/6W
R613	1-247-867-00	CARBON	33K	5%	1/6W
R614	1-249-421-11	CARBON	2.2K	5%	1/6W
R615	1-247-847-00	CARBON	4.7K	5%	1/6W
R616	1-247-847-00	CARBON	4.7K	5%	1/6W
R617	1-247-871-00	CARBON	47K	5%	1/6W
R618	1-247-817-00	CARBON	270	5%	1/6W
R619	1-247-829-00	CARBON	820	5%	1/6W
R620	1-247-825-00	CARBON	560	5%	1/6W
R621	1-247-885-00	CARBON	180K	5%	1/6W
R622	1-249-421-11	CARBON	2.2K	5%	1/6W
R623	1-247-847-00	CARBON	4.7K	5%	1/6W
R624	1-247-847-00	CARBON	4.7K	5%	1/6W
R640	1-247-867-00	(ST-158)...CARBON	33K	5%	1/6W
R643	1-247-879-00	CARBON	100K	5%	1/6W
R644	1-247-847-00	(ST-158)...CARBON	4.7K	5%	1/6W
RV201	1-228-997-00	RES, ADJ, CARBON 100K			
RV301	1-228-997-00	RES, ADJ, CARBON 100K			
S701	1-554-303-00	SWITCH, KEY BOARD (BAND)			
S702	1-554-303-00	SWITCH, KEY BOARD (STEREO MUTING)			
S703	1-554-303-00	SWITCH, KEY BOARD (MEMORY)			
S704	1-554-303-00	SWITCH, KEY BOARD (TUNING -)			
S705	1-554-303-00	SWITCH, KEY BOARD (TUNING +)			
S706	1-554-303-00	SWITCH, KEY BOARD (PRESET 1)			
S707	1-554-303-00	SWITCH, KEY BOARD (PRESET 2)			
S708	1-554-303-00	SWITCH, KEY BOARD (PRESET 3)			
S709	1-554-303-00	SWITCH, KEY BOARD (PRESET 4)			
S710	1-554-303-00	SWITCH, KEY BOARD (PRESET 5)			
T201	1-404-419-00	COIL, DISCRIMINATOR			
T401	1-404-535-11	COIL (WITH IFT)			
TM101	1-536-901-11	(AEP,UK)...TERMINAL BOARD 3P, ANTENNA			
TM101	1-536-733-11	(G-AEP)....TERMINAL BOARD, ANTENNA			
X301	1-567-250-11	OSCILLATOR, CERAMIC			
X601	1-567-125-00	VIBRATOR, CRYSTAL			